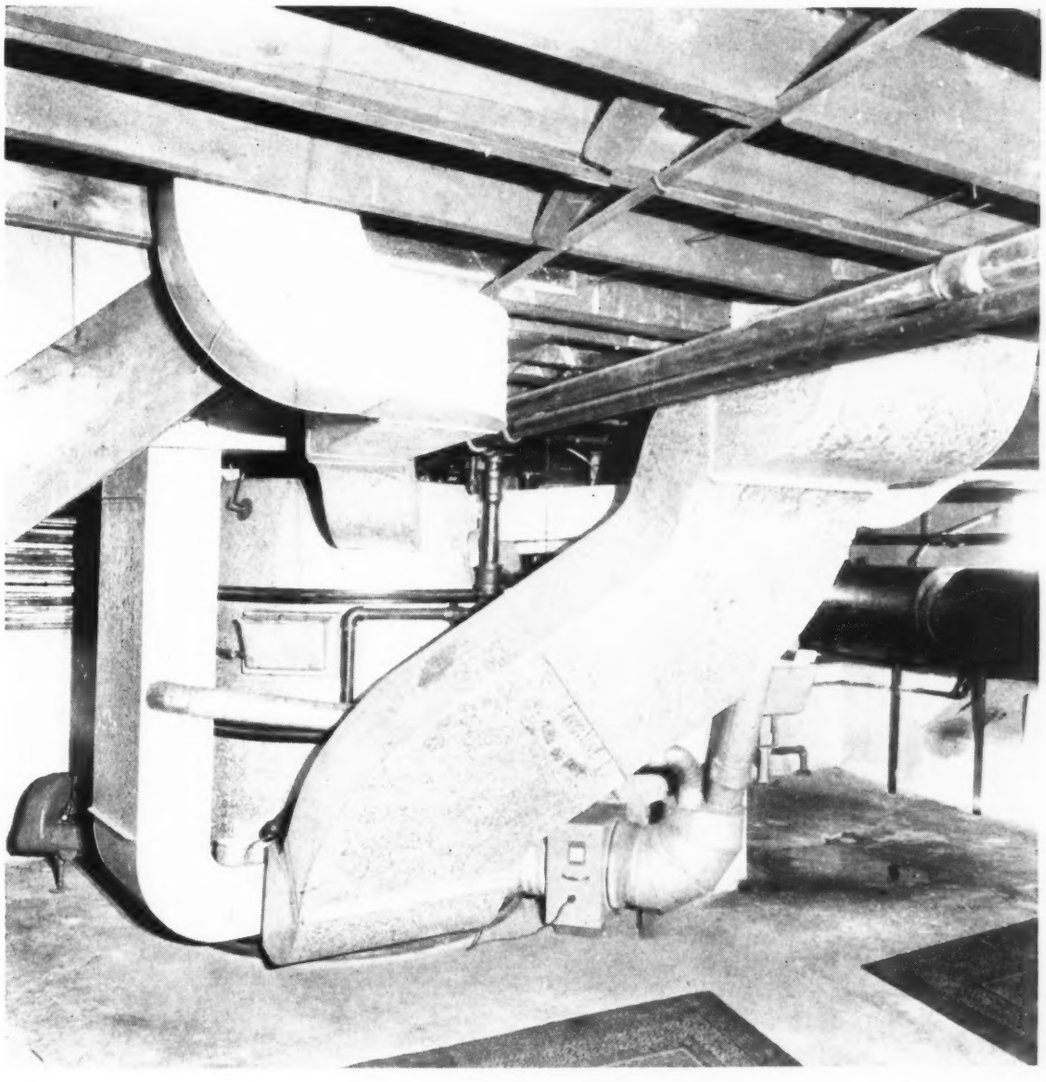
American Artisan

THE WARM AIR HEATING AND SHEET METAL JOURNAL

FOUNDED 1880



Warm Air Heating Men and Home Owners Alike Can Be Proud of Installations Like This. More and More Such Plants Are Being Put in. The Details of This Job Are Given on Page 20

JULY 5, 1930

Go After the Prospects Who Have the Money!

Most of Your BEST Prospects Have Never Heard of Modern Warm Air Heating

More Large Expensive Homes are Being Heated With Warm Air This Year Than Ever Before---

AND it's easier in many cases to sell this type of prospect. Watch your leads now and pick out the better class jobs. Go after the owners with your story and remember that they don't know how comfortable, healthful, economical and MODERN warm air heating is. Tell them all the many advantages of this form of heating—it's news to most folks.

Sell them first on MODERN WARM AIR HEATING, then when you have sold the idea remember that you have succeeded because you sold QUALITY not PRICE.

They will expect you to show them only the highest grade of equipment to make up this modern warm air heating system. They will also expect this system to be worth a good price and it's on this class of business that you can do your best work and add a good profit.

Try getting this class of business now and make sure of the furnace by using Success Heaters.

Success Heaters are made for high grade heating systems. They will help you make better profits. Write today for full details of construction.

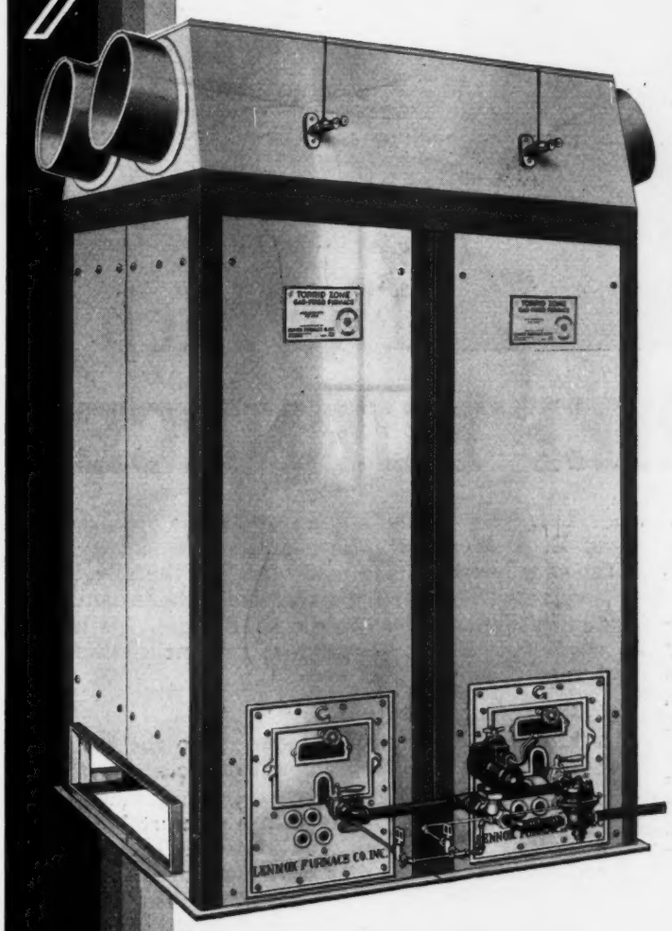
We help you SELL Success Heaters and Better Warm Air Heating—just ask us to tell you about the Big Success Idea.

SUCCESS HEATER MANUFACTURING COMPANY, DES MOINES, IOWA

SUCCESS HEATERS

5 mm 18 Tm 1931

Announcing the Modern TORRID ZONE GAS-FIRED FURNACE



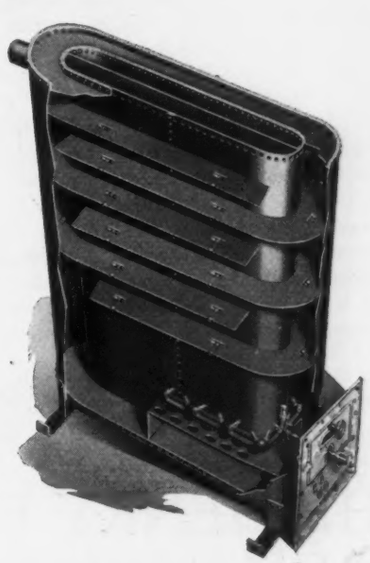
The new Torrid Zone Gas-Fired furnace takes its place in the front rank with the famous line of Torrid Zone riveted steel furnaces. It is designed exclusively for burning natural and manufactured gas and is the only riveted steel gas furnace on the market today.

Six horizontal baffles force unusually long smoke travel. The narrow gas passages decrease in size as the gases cool thus giving constant velocity to the gases in their travel through the furnace. Gas travel is constantly upward, so there is no condensation and no danger of explosions.

The tremendous area of steel heating surface is responsible for the unusual efficiency of the Torrid Zone. There is more heating surface per B. T. U. Input in it, than in any other standard approved make of gas furnace made. All surfaces are smooth and vertical . . . the air stream is parallel with them. The smooth vertical surface has been found to be the best heat transmitter.

Heavy plates of copper bearing boiler plate steel are riveted together for strength and calked for tightness . . . making it a pressure-tight gas furnace.

Not only has the new Torrid Zone passed the approval requirements of the American Gas Association but has added new economy, new safety and new durability to a famous line of furnaces. It is built in units ranging from the No. 1 with 60,000 B. T. U. Input on up to any desired size of furnace.



LENNOX FURNACE COMPANY, INC.
MARSHALLTOWN, IOWA SYRACUSE, NEW YORK
TORONTO • WINNIPEG

S.M. 13 III 1931

Published Every Other Week by Porter, Spofford, Langtry Corp., 139 North Clark Street, Chicago, Illinois. AMERICAN ARTISAN—the Warm Air Heating and Sheet Metal Journal—entered as second class matter, January 29, 1930, at the Post Office at Chicago, Illinois, under the act of March 3, 1879. Formerly entered on June 25, 1887, as American Artisan and Hardware Record.

INDEX PAGES—12 and 56 **[VOL. 99, NO. 14—$2.00 PER YEAR]** **BUYERS' DIRECTORY—52 and 54**

E. S. MONCRIEF
President of The Henry Furnace and Foundry Company

The Men behind MONCRIEF FURNACES

"HAPPY is the man who finds joy in his work," wrote the Persian poet.

Lucky is the man who finds his life's work right at the start.

E. S. Moncrief is that happy, lucky man. Incidentally, nobody thinks of addressing him by any other name than Dick. It is difficult to link up this name with his initials; but no matter, it is a good name applied to a good fellow and fits very aptly.

Dick Moncrief started in the furnace business in Atlanta, Georgia, his native city, at the age of fourteen. He liked the business, which, aside from selling and installing, consisted also of making sheet steel radiators, besides pipe, boots and boxes in the shop.

The business liked him, and it was not long before he was estimating and selling. He worked daytimes and went to school nights. So successful was he that, within a few years, he was selling and installing furnaces far beyond the borders of his state.

In 1905 he established his own business, The Moncrief Furnace Company at Dallas, Texas. Here he sold the Moncrief Furnace, made in Cleveland.

In 1907 he came to Cleveland to become sales manager for the present company. His first job was to strengthen sales locally, and later his activities extended over the state and nation. Next, he was made Vice President, and in February of this year was elected President of the company.

This, very briefly, is the story of the business life of E. S. Moncrief. His charming personality and good fellowship have made for him literally thousands of friends, all the way from the Atlantic to the Pacific and clear to the Gulf Coast. He is, indeed, one of the outstanding personalities of the furnace business in America.

* * * *

Moncrief Furnaces are made to do the best job of heating for the least amount of money.

They have a fine history, extending more than thirty years back, making homes comfortable, making money for dealers who installed them as correctly and as well as they were made at the foundry.

The Series "C" Moncrief is the finest cast furnace that money can buy—newly designed—none better made in America, and none that gives the dealer more value for the dollar.

The new Moncrief Steel Furnace is a recent addition to the line, with points of merit well worth looking into.

Send for descriptive literature

THE SERIES "C"

We supply everything used in a warm air heating job

THE HENRY FURNACE & FOUNDRY CO.

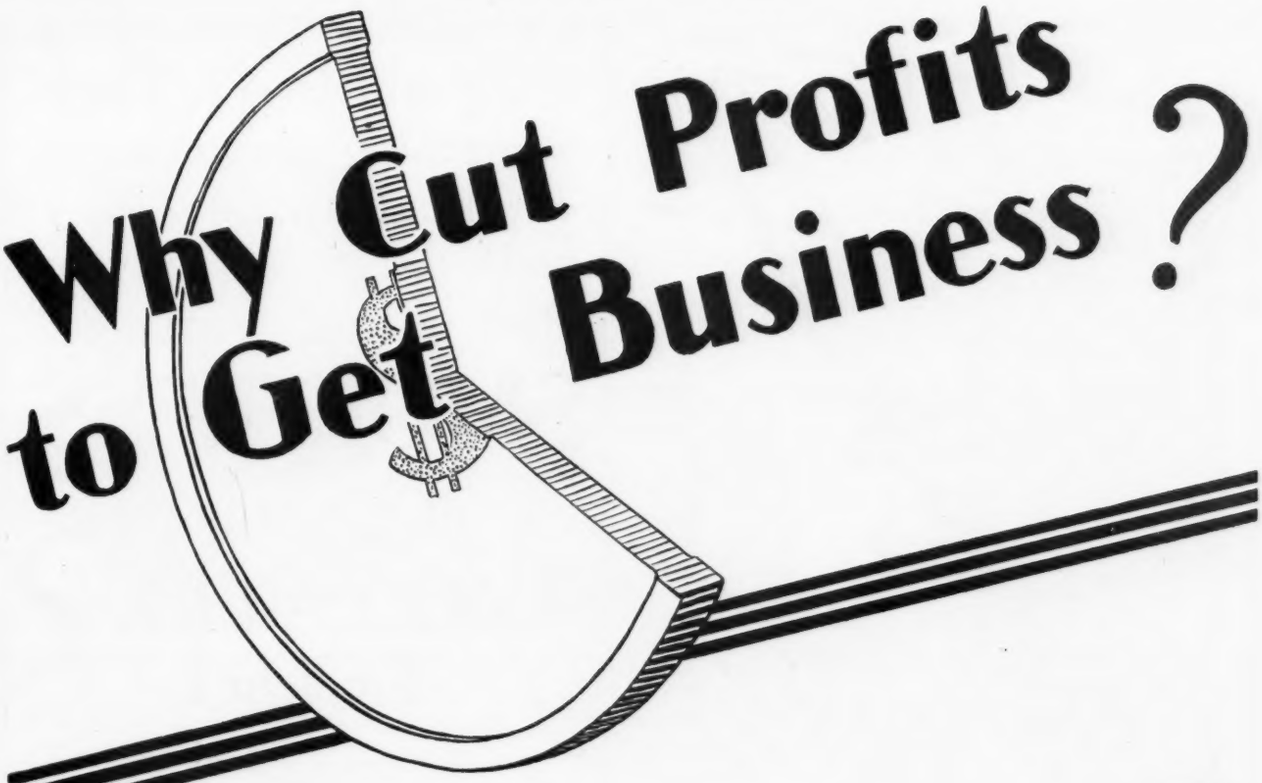
3471 EAST 49th STREET **CLEVELAND, OHIO**

THE SERIES "C" CAST FURNACES

THE NEW MONCRIEF STEEL FURNACE

Say you saw it in AMERICAN ARTISAN—Thank you!

Why Cut Profits to Get Business?



YOU can't make money in the heating business just "trading dollars." That is what you do when you sell an ordinary furnace, with nothing to talk about except price. You usually have to be satisfied with a small profit in order to beat the other fellow's low price. Competition cuts the profit to the bone.

Waterbury Dealers do not have to cut their profits to get business. They have something more than price to sell. They have a heating system with exclusive features not found in ordinary furnaces—added advantages that people want and are willing to pay for.

Investigate the Waterbury and you will find out why your customers will be willing to pay you a little more for a heating system that is worth a whole lot more to them. You will be able to get the business without cutting profits—at a price that makes money for you.

The Waterbury Merchandising Sales Plan, a part of the Waterbury Franchise, helps you get the business. Send coupon for complete information.

The Waterman-Waterbury Co.

1122 Jackson St. N. E. Minneapolis, Minnesota

Complete Stock Carried in

PHILADELPHIA DENVER TACOMA
KANSAS CITY CHICAGO PITTSBURGH
SAN FRANCISCO

WATERMAN-WATERBURY CO.
1122 Jackson St. N. E.,
Minneapolis, Minnesota

Please send me complete details about the Waterbury Franchise and the Merchandising Sales Plan to help me get business.

NAME.....

ADDRESS.....

CITY..... STATE.....

Testimonials Like This Build Business

SMITH HEATING AND SHEET METAL WORKS
Springfield, Missouri

American Furnace Company,
2719 Morgan St.,
St. Louis, Mo.

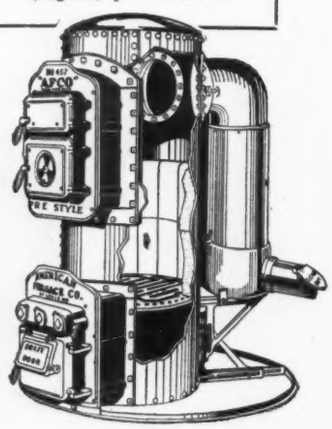
Gentlemen:

We have just installed one of your No. 348 American Furnaces in a $20,000.00 residence here. The owner took this furnace out of an old residence that he had torn down and put it in his new residence.

The only repairs that we used new was a cast iron inside feed pouch liner. This furnace will be equipped with an oil burner.

The writer thinks that this is a wonderful compliment in view of the fact that this is a fine residence and the furnace had been subjected to twenty years of service prior to the installation in the new residence.

Respectfully,
(Signed) J. V. SMITH.



Successful, enduring businesses are built around quality products. This is just as true of furnace installers as it is of furnace manufacturers. The letter quoted is evidence of the quality of "AFCO" furnaces and the prestige that they give to "AFCO" installers.

Your business will prosper when you can offer your customers quality "AFCO" Boiler Plate furnaces backed by a manufacturer with more than 30 years' experience in building reliable heating equipment.

Write for the "AFCO" dealer proposition today —it places you under no obligation.

AMERICAN FURNACE COMPANY
St. Louis, Mo.

"AFCO"
Boiler Plate Furnaces

They know you know something about warm air heating *and* they *will* listen when you start telling them about

SMOKELESS
Operation
GREATER
Efficiency
AND
LOWER FUEL COSTS
OBTAINED WITH

THE PIPE AND ATH-A-NOR PIPELESS FURNACE

START now to *sell* warm air heating. Do a good *selling* job and you'll get a bigger profit—*BUT* be sure you are offering your customers real quality.

The Ath-A-Nor furnace has the selling points and the quality features to back up your story.

Besides the Ath-A-Nor the May-Fiebeger line includes several styles and a complete range of sizes in both cast iron and steel furnaces.

Every May-Fiebeger furnace is high grade and reasonably priced

The May-Fiebeger Co.
Newark, Ohio

all your purchases from one source

WISE FURNACES

BELOW is shown the New Wise Steel Furnace. A Wise product and a steel furnace having exclusive Wise features. Notice the Cast Iron Soot Box and Clean-Out on bottom of Radiator—the weak spot of steel furnaces eliminated.

THE Wise Open Dome 40 Series with Self Cleaning Radiator is even better than ever with its new One-Piece heavy Cellular Firepot and new Elbow Shaped Collar on inside of radiator which is turned up so that all the heat must follow the castings to the top before entering the flue.

THE Wise 20 Series Return Flue Radiator has a new Patented radiator. Now cleaning the radiator is easy. The feed chamber and the radiator are designed so that the fire flues are easily gotten at from the upper feed door with the soot falling directly into the firepot. Also equipped with the new Cellular Firepot.

Write for catalog No. 23

The WISE FURNACE COMPANY, *Akron, Ohio*

WAMPUM BRAND

Odorless— Pliable— Will not crack—

LASTIK

Firmly knit— Non-porous— Acidproof—

FURNACE CEMENT

BE the Big Chief in your territory when it comes to doing high grade warm air heating. Tell your customers that you've done enough trouble shooting to know a "heap good joint cement" when you see it and that when *you* cement a furnace it CAN'T LEAK because you use Wampum Brand Furnace Cement—the furnace cement that CAN'T COME LOOSE.

Get the right aim on SATISFACTORY business now—order a can from your jobber today.

LASTIK PRODUCTS CORPORATION

General Offices, Oliver Bldg., PITTSBURGH, PA.

Also Manufacturers of LASTIK ROOF PAINTS and CEMENTS — LASTIKALK — LASTIK DAMP-PROOFINGS

BRILLION *FURNACES*

For Quality Sales With Better Profits

YOU don't have to skimp on weight or up-to-date features in order to offer your customers a furnace at a fair price. Just look at the Brillion —isn't it the kind of furnace that appeals to the careful, particular buyer?

You'll agree still more enthusiastically when you *actually* see it— and its low price will surprise you.

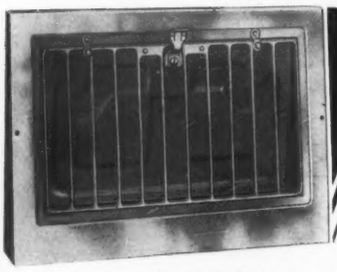
There are several good reasons why we can sell this high quality at a lower price than you'd expect—let us tell you all about it now. Send the coupon.

BRILLION FURNACE CO., 3715 Elston Ave., Chicago.
200-300 Park Ave., Brillion, Wis.
Send me full details and Catalog No. 80.

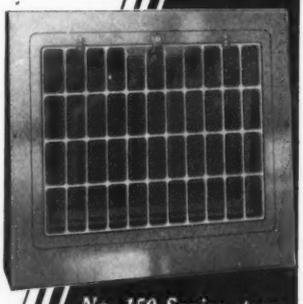
Name.....

Address.....

Long Time Favorites



No. 170 Series, two-piece register. Also made in one-piece type, No. 190.



No. 150 Series, two-piece register. Also made in one-piece type, No. 160.

THE H. & C. No. 150 and No. 170 Series Registers have long been favorites with a host of furnace installers. The great number of them used year after year and the preference accorded them is conclusive proof that their unassuming attractiveness and mechanical superiority will go mighty well with most of the people you will endeavor to sell.

There's a world of satisfaction in handling "THE BEST."

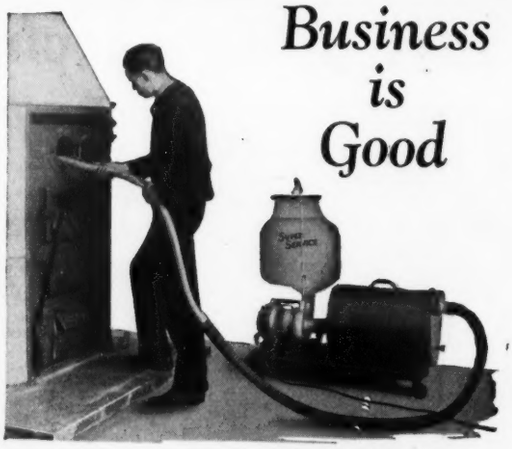
Hart & Cooley Mfg. Co.

CHICAGO, 61 W. Kinzie St. NEW YORK, 101 Park Ave.
PHILADELPHIA, 1600 Arch St. BOSTON, 75 Portland St.
NEW BRITAIN, CONN. — NASHUA, N. H.

Factories at Holland, Mich., New Britain, Nashua

ALSO A COMPLETE LINE OF FURNACE REGULATORS, CHAIN, PULLEYS, DAMPERS, ETC.

Business is Good



Our one-man outfit makes low overhead

A FLINT, Mich., user's good judgment is confirmed. He writes: "The Super Suction Cleaner for furnaces has proved an entire success. We have worked up a nice business and are increasing our orders as we go."

Why not you, too? Try a Super Suction free. Flint did — you cannot lose. Our Plan Book—also free—shows the easy steps to success. Write today about this free trial

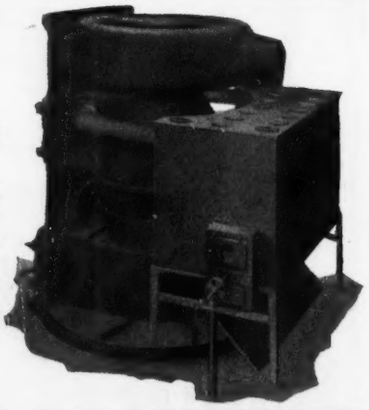
THE NATIONAL SUPER SERVICE CO.
1944 N. 13th Street Toledo, Ohio

You can sell
GAS HEATING
to OLD as well as new customers with
The MUNKEL GAS ATTACHMENT

It fits any coal furnace—it heats both units giving extra large radiating surface. Simple, efficient, economical and easy to install. Stimulate business and make more profits with the Munkel Gas Attachment.

Write today for full details

The **MUNKEL-RIPPEL HEATING CO.**
"31 Years of Service"
Columbus, Ohio



GILTEDGE
guaranteed
FURNACES

FOR fifty-five years the name GiltEdge has meant high quality furnaces. Today more than ever before GiltEdge Furnaces lead as to quality and workmanship.

The GiltEdge agency will add extra prestige and profits to your business.

Write today for full details regarding the GiltEdge 1930 sales plan.

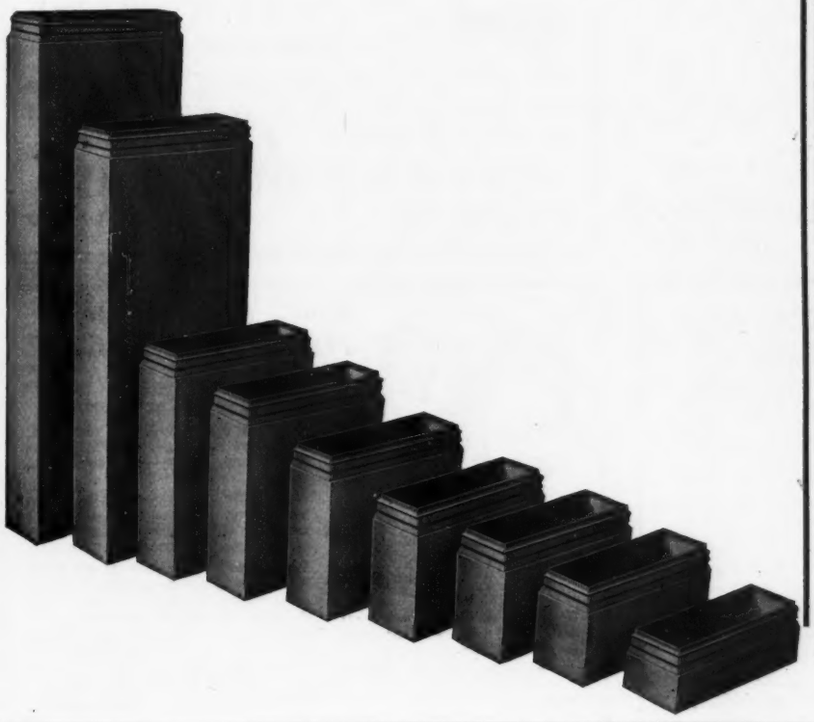
R. J. SCHWAB & SONS CO.
283 Clinton Street Milwaukee, Wis.

F. Meyer & Bro. Co.

Peoria ~ ~ ~ Illinois

The Handy Pipe People

Take These Steps to Furnace Pipe Satisfaction



THE satisfaction that comes to YOU from having your pipe orders filled promptly and from receiving pipe that is "HANDY" to work with.

The satisfaction to both you and the home owner that

HANDY PIPE

always gives to both; it is built to outlast the buildings it goes into.

F. MEYER & BRO. COMPANY

Peoria Illinois

Say you saw it in AMERICAN ARTISAN—Thank you!

only $48 installed

Yet Four Exclusive Features

1 Automatically checks furnace in event of electrical current break.

2 Automatically re-engages after fueling.

3 Three Minute Automatic Action.

4 No gears, electric motors, clocks or dry batteries—nothing to oil.

Thousands are in use.

SHEER COMFORT *heat Regulator*

Ask your jobber or write
H. M. Sheer Co., 213 Hampshire St., Quincy, Illinois

"American Seal"

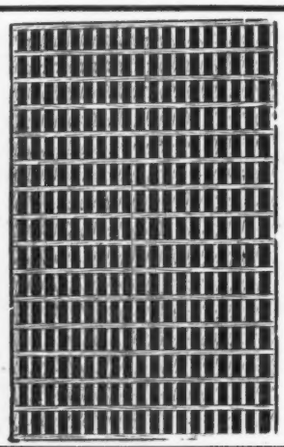
FURNACE CEMENT

Roof Cement—Stove Putty
Plumbers Putty

PAINTS AND SPECIALTIES

WILLIAM CONNORS PAINT MFG. CO.
Established 1852
TROY NEW YORK

JAMES L. PERKINS, Western Distributor
140 South Dearborn Street, Chicago, Illinois



AMERICAN *WOOD* REGISTERS

WHEN you order wood registers be sure of getting the best by buying these famous wood faces—

Known as the finest for over 21 years

They add extra value without extra cost. We make nothing but Wood Registers and only the best.

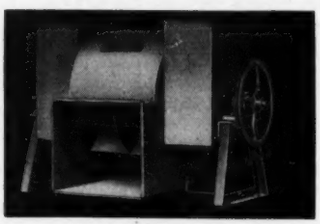
Write today for catalog and latest price list.

The AMERICAN WOOD REGISTER CO.
Plymouth Indiana

Furblo *The Furnace Blower Everyone Recommends*

MANUFACTURERS have adopted FURBLO as standard equipment — jobbers catalog FURBLO exclusively —dealers everywhere find FURBLO the one and only satisfactory solution to the problem of mechanical warm air heating.

FURBLO is not a fan—but a blower. Quiet, efficient, powerful, sturdy, dependable. Guaranteed to always produce on even the hardest job.

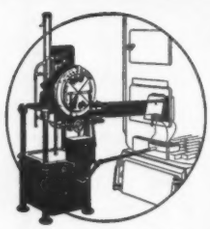


Lakeside Company
Dept. A7 Hermansville, Mich.

Two sizes fit practically all installations. Send for complete information.

Makers of Lakeside Ventilating Equipment

Balanced Heat



Listed as Standard by Underwriters Approved by New York Board of Standards and Appeals

The McIlvaine Method of Oil Heating

With the fidelity of a well-balanced scale, the amount of heat supplied by the McIlvaine Method automatically increases or decreases exactly as the temperature outside demands. Thus, an even temperature is maintained indoors, all winter long. The McIlvaine Continuous Flame Oil Burner (recommended by the leading warm air heating experts) with its five flame sizes, automatically balanced to the heat demand, gives positively satisfactory results, and is highly efficient when installed in warm air and other types of residence heating systems.

WRITE NOW
for dealer's proposition, sales plan and complete information.

McILVAINE BURNER CORPORATION
747 Custer Avenue Dept. A Evanston, Ill.

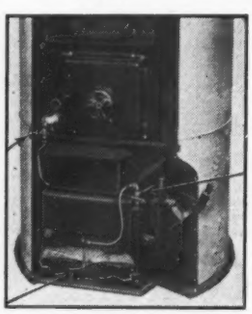
Refer to Dept. F

CRANKS *for* STOVES *AND* FURNACES

We have over 100 patterns of various sizes and shapes so that we are in a position to fit any range or furnace.

THE FANNER MFG. COMPANY
Brookside Park Cleveland, Ohio

FURNACE MANUFACTURERS AND JOBBERS—



Give your trade this extra feature

FURNACE DUST ELIMINATOR

A NEW patented appliance that makes ash removing a clean job. Nozzle emits a fine spray of moisture which settles dust. Control valve conveniently located. Sleeve connection allows nozzle to swing out of the way with door. First quality materials throughout. Practical, efficient, and inexpensive.

Write for full information and prices today.

DUSTLESS ASH COMPANY, MUSKEGON, MICH.

Order a trial can now — it will not sour — keeps any length of time.

A new furnace paste

FOR BETTER, NEATER AND QUICKER WORK

Non-Cereal—Non-Souring

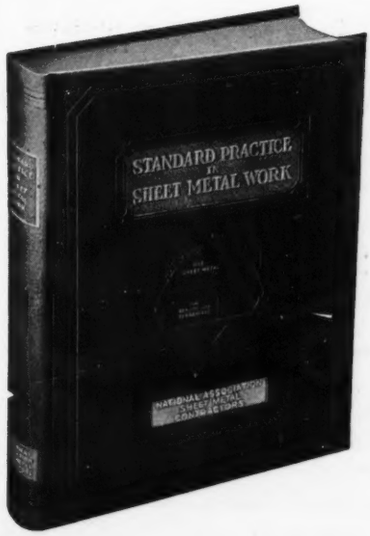
Asbestos Paper will not absorb it as it does cereal pastes. Paper does not become soggy—not so apt to tear.

Larco Mineral Paste does not turn brown—no stains—mice will not touch it either when moist or dry and it does not gum up the hands.

Larco Paste can be kept on hand mixed ready for use. It has greater covering qualities. It slips easily but adheres permanently.

Write for circular which tells all about it—get Larco prices.

WESTERN MINERAL PRODUCTS CO.
OMAHA *(Formerly Larsen-Bennett Co.)* NEBRASKA



This is the BIG BOOK prepared and published by theTrade Development Committee of the

National Sheet Metal Contractors' Association

IT covers every branch of the sheet metal industry including warm air furnace heating.

It illustrates and describes the Standard Practice of constructing and installing *all* sheet metal work.

It is the only authority on Standard Practice to which you can refer for reliable data.

It will earn its cost the first day you have it in your shop.

It belongs in every Sheet Metal Shop and in every ARCHITECT'S office.

Get your copy now and you'll see why it will pay you to present a copy to at least one architect in your town. With this book in his office the architect has a RELIABLE, AUTHORITATIVE source of reference to aid him in specifying sheet metal work.

ARCHITECTS CAN'T SPECIFY WORK THEY DON'T KNOW ANYTHING ABOUT—THIS BOOK TELLS THEM AND SHOWS THEM HOW TO SPECIFY QUALITY SHEET METAL WORK OF EVERY NATURE.

The book contains 768 9x12 pages—494 pages of illustrations and 274 pages of text.

Price $10.00 postpaid

Order through the Book Department of

AMERICAN ARTISAN

139 North Clark Street Chicago, Ill.

Sell positive warm or cool air delivery with the . . .

AM-PE'-CO

ROTARY BLOWER

WITH the Am-Pe'-Co Rotary Blower you can safely assure heat distribution and uniform, positive delivery of air to every room.

Especially Designed for Warm Air Heating Systems

The AM-PE'-CO is a blower designed for more efficient heating—it is the ***only blower*** that has a fully balanced distribution to both inlets. Notice the air space back of the scroll or blower housing which provides increased and better distribution of air, actually increasing capacity of the blower. This air chamber permits unrestricted entry of free air from top, side and bottom of inlets.

Go After Sales Now

Because the AM-PE'-CO is a ***positive*** blower you can sell and install it ***now*** with a guarantee that it will aid in cooling the home this summer.

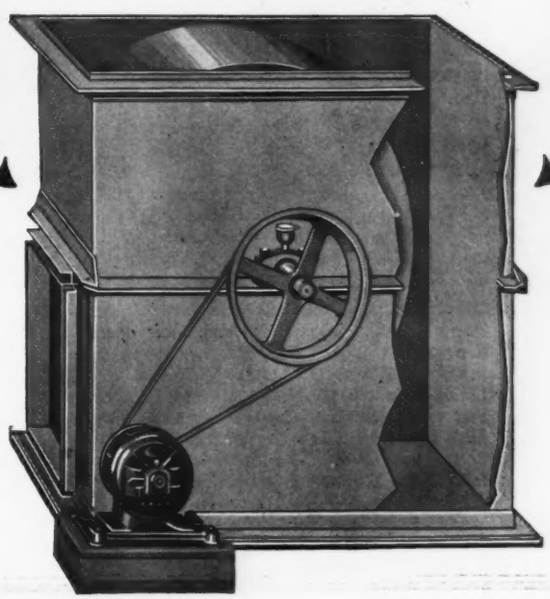
Silent—Compact—Low Priced

The AM-PE'-CO is quiet—almost noiseless—it is compact and easy to install and because of air chamber in rear air may be taken from top, rear or bottom.

You can make better profits using this better blower. It is priced for popular quality appeal. It is made by a Company thoroughly experienced in making precision products.

Write today for full details and prices

AMERICAN MACHINE PRODUCTS CO.
MARSHALLTOWN, IOWA



Founded 1880

American Artisan

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Entered as second class matter, January 29, 1930, at the Post Office at Chicago, Ill., under act of March 3, 1879. Formerly entered on June 25, 1887, as American Artisan and Hardware Record.

Yearly Subscription Price:

United States $2.00
Canada $3.00
Foreign $4.00
Single Copies 25c

Published EVERY OTHER SATURDAY—to Promote Better Warm Air Heating and Sheet Metal Work

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PORTER-SPOFFORD-LANGTRY CORPORATION

139 North Clark Street, Chicago—Telephone Central 7670

Fred D. Porter, *President* John C. Langtry, *Vice-President* Howard H. Bede, *Secretary*
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Advertising Representatives:
Charles E. Kennedy — J. F. Johnson

New York Office: 295 Madison Avenue, Room 1109, *Tel. Ashland 5342*
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Vol. 99, No. 14 CHICAGO, JULY 5, 1930 $2.00 Per Year

Table of Contents

Page

Specialists in Heating 15
An editorial

Cost Accounting 16
The sixth article in the series by J. G. Dingle. In this article Mr. Dingle gives details on all of the accounts which appear in a general ledger and explains their purpose.

Three-Piece, 90 Degree Elbow 19
W. R. Haines, contributing editor, works out a pattern for an elbow of 90 degrees and made in three pieces. This is a simplified design.

A Combination Heating System 20
The details of an interesting heating system installed in Pekin, Illinois, by The Pekin Hardware Company. The second floor of this house is heated with hot water, while the first floor is warm air heated.

Organization and Co-operation 23
The address of J. E. Merrick, past president of the National Association of Sheet Metal Contractors, at Pittsburgh.

A Flag Pole Enclosure 24
The use of sheet metal for ornamentation is becoming popular all over the country. Here are the details of an unusual job in which a tall building flag pole was encased in aluminum.

Fan Fundamentals 26
There is much interest in fans, their operation, action under different conditions, results, etc. AMERICAN ARTISAN *publishes some fundamental facts about fans. It is hoped that this series will clear up much of the false information going around and lead to a better understanding of what can be done with fans. The series is by G. A. Voorhees, Heating Engineer, Indianapolis, Ind.*

Page

Engineered Heating 30
In Pittsburgh, B. L. Schwartz has installed some of the nicest gas operated heating plants to be found in this part of the country. This article shows pictures and layouts of one of his recent jobs.

Chimneys 26
As new codes and ordinances are put into operation in towns and cities it behooves every heating man to see that such things as chimneys are built so that the heating equipment is given a chance to prove its worth. This is the first of two articles on how good chimneys should be built.

Cashing In on Advertising 37
An address by Thomas D'A. Brophy on the need for advertising. This address was given before the recent convention of sheet metal contractors. It gives some very pertinent facts about this important subject.

That Floor Draft Problem 39
Readers are still sending us their solutions to that floor draft problem we published May 24. In this issue we correct a plan shown before and publish a solution from a reader who just couldn't resist solving the problem.

Monitors vs. Ventilators 40
A reader requested information on how to sell industrial plants ventilators to replace movable window sash as a ventilating means. Paul R. Jordan relates his experience in selling such jobs.

Random Notes and Sketches 43
Notes and Queries 44
Association Activities 45
News Items and New Items 46

"We are doing a *real* business in Anaconda Copper"...

... writes L. C. Potts, General Supervisor of B. & H. Passmore Metal & Roofing Co., Oklahoma City, Oklahoma.

THIS progressive sheet metal concern, whose ability won the sheet metal contract for the new $1,500,000 Boston Ave. M. E. Church in South Tulsa, finds Anaconda Copper a great help in getting *profitable* business. Mr. Potts writes:

"All I want to say is that you people make a *real* product, and we are doing a real business in Anaconda Copper. We find that many home-owners and most architects know the economy of Anaconda Copper. By pushing your product we have gotten away from price competition and are making a good profit on our jobs."

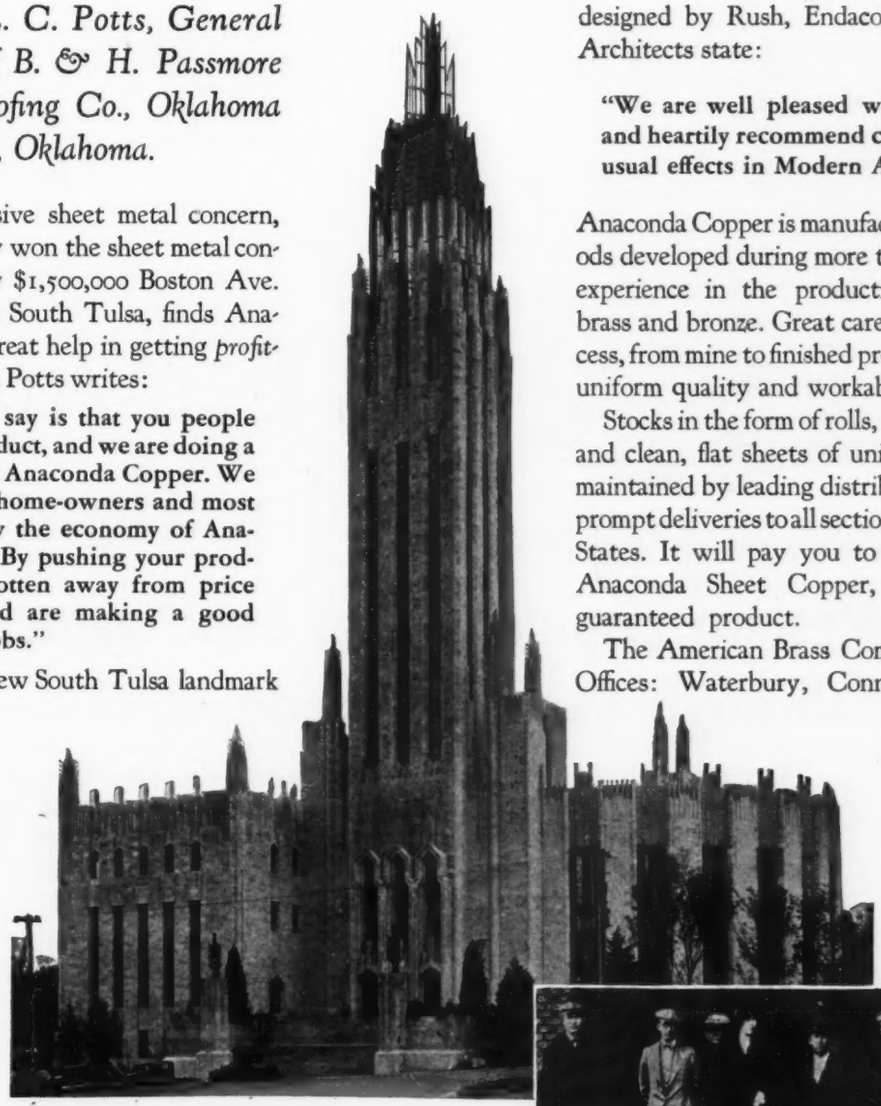
Concerning this new South Tulsa landmark designed by Rush, Endacott & Goff, the Architects state:

"We are well pleased with the result and heartily recommend copper for unusual effects in Modern Architecture."

Anaconda Copper is manufactured by methods developed during more than a century's experience in the production of copper, brass and bronze. Great care with each process, from mine to finished product, produces uniform quality and workability.

Stocks in the form of rolls, Economy Strips and clean, flat sheets of uniform gauge are maintained by leading distributors, assuring prompt deliveries to all sections of the United States. It will pay you to standardize on Anaconda Sheet Copper, a time-tested, guaranteed product.

The American Brass Company, General Offices: Waterbury, Connecticut.



The Boston Avenue M. E. Church, South Tulsa, Okla., on which was used 8 tons of Anaconda Copper. A small percent of the copper was used on wall spandrels, etc., but the bulk was used on the tower above the masonry.

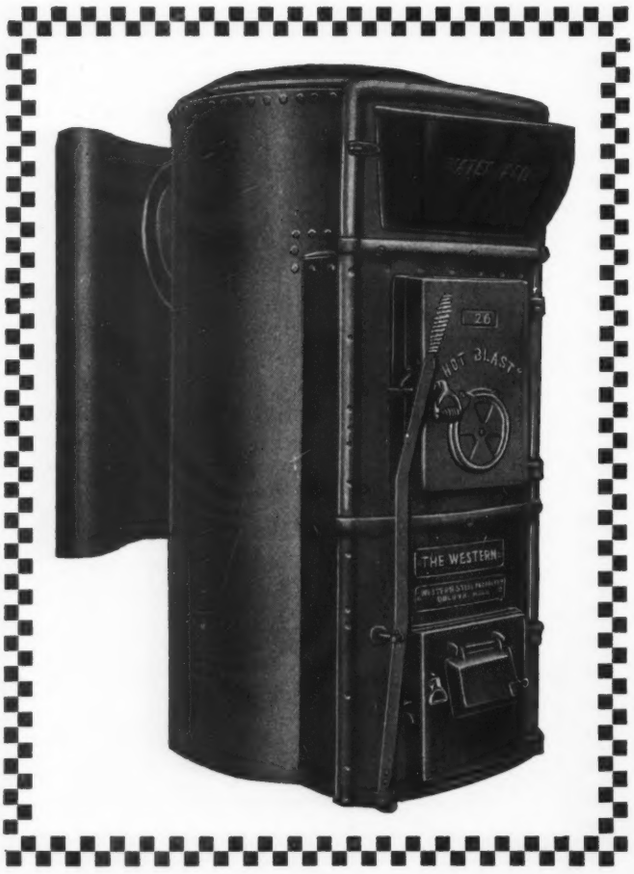
Part of the staff of the Passmore shop: (from left to right) J. H. Passmore, Hollis Passmore, Edith Steeds, Burnice Passmore. L. C. Potts; and E. B. McKee of Milwaukee Corrugating Company, who supplied the Anaconda Copper for this job.

Sheet Metal Work of

ANACONDA COPPER

ANACONDA from mine to consumer

Look for the name ANACONDA in every sheet and strip. Leading Supply Houses carry it.



Its Eye-Appeal Is Incidental

Western popularity has been gained through years of steady service

You may sell many a Western Furnace on its attractiveness to the eye alone, but it'll be the years of faithful service that'll bring your customer back again and again for other merchandise. It'll be the practical construction and convenience that'll be recommended to friends interested in furnaces.

There was no eye-appeal considered by the designers. They were interested in a practical furnace for the practical job of heating homes all over the globe. Experimental parts and fancy ding-bats were taboo. Every part on the Western has a definite purpose.

WESTERN STEEL PRODUCTS CO.

130 Commonwealth Ave.—Duluth, Minn.

Group One

Pittsburgh, Pa. — *Pittsburgh Furnace Parts Company*

Ravenna, Ohio — *Ravenna Furnace Company*

Cincinnati, Ohio — *Niehaus Furnace Repair Company*

Atlanta, Ga.—*Moncrief Furnace Company*

Chicago, Ill.—*Western Steel Products Company*

Group Two

St. Louis, Mo.—*MacRoy Supply Co.*
Kansas City, Mo.—*Kansas City Furnace Co.*
Duluth, Minnesota—*Marshall-Wells Co.*
Omaha, Nebraska—*A. Y. McDonald Mfg. Co.*
Lincoln, Nebraska—*A. Y. McDonald Mfg. Co.*
Sioux City, Iowa—*A. Y. McDonald Mfg. Co.*
Minneapolis, Minn.—*A. Y. McDonald Mfg. Co.*
Fort Dodge, Iowa—*Leighton Supply Co.*
Fargo, N. D.—*Fargo Cornice & Ornament Co.*

Group Three

Seattle, Wash. — *McPherson Furnace & Equipment Co.*
San Francisco, Cal.—*Pacific Sheet Metal & Furnace Co.*
Winnipeg, Man. — *Marshall-Wells Co.*
Saskatoon, Sask. — *Wood-Vallance Co., Ltd.*
Regina, Sask. — *Wood-Vallance Co., Ltd.*
Edmonton, Albta.—*Marshall-Wells Alberta Co., Ltd.*

American Artisan

THE WARM AIR HEATING AND SHEET METAL JOURNAL

Vol. 99 CHICAGO, JULY 5, 1930 No. 14

Specialists in Heating

A FRIEND of mine owns a house which is his pride and joy. It is maintained immaculately inside and out. Nothing is allowed to deteriorate. He is that kind of a home owner.

But as anyone could guess, the cost of keeping his home in such condition is high. Unless a man is a member of a family having one member in each trade, it can't help but be.

Last year he discovered a jack-of-all-trades who seemed to be able to do most anything around the house and do it well. For example, my friend wanted a drain put in the floor of his garage. He was quoted $50.00 by a local contractor. The jack-of-all-trades said he could do the job and in three days had the drain in and the floor repaired. The cost was $15.00.

The drain worked fine all last fall. But this winter when the ground froze up it refused to function. It didn't work till the ground thawed out. My friend couldn't figure it out. So he called in the jack-of-all-trades who had returned from California, and found out that the drain didn't connect with anything except a small pocket of gravel. That's how he got his job in so cheap.

If you just stop to think about it, there is a surprisingly lot of that kind of work going on. It hits our field of warm air heating especially hard. As a matter of fact, the warm air industry is just jammed full of jack-of-all-trades.

But the number of truly heating men is remarkably limited.

It really doesn't seem that the man who can do a little of everything some way, somehow, can long exist in heating. But he is showing remarkable staying powers and it may be years before we can shake him off. He it is who drops in on a good warm air town, gets himself a couple of cheap furnaces, gets a line on a couple of prospects and using a line of sales talk which would do credit to a much better business man, gets the contracts to heat some houses good heating men have been sort of keeping for a slow spell.

Invariably price is his strong talking point. He is sure to pull that old one, "I haven't any overhead for my shop is in a barn, and I don't maintain a big office, show room or carry a lot of mechanics on my payroll."

The prospect who wants to save a few dollars greets this wanderer as though he was a long lost son. He gets the job, slaps a heating plant in place the shortest possible way and goes on to the next victim.

There is only one way to get around that situation. That way is to be a specialist. A specialist in heating. If you can work up that reputation, no fly by night can injure you. You will be immune to the stigma he leaves on the industry.

Being well known won't turn the trick. Because folks buy elsewhere rather than say their friend's price is too high. Having a reputation for being in the community for twenty years won't turn the trick either. An old timer is often looked at as being so long there his prices are out of line with the present. A reputation for honesty and a reputation for quality merchandise won't turn the trick, for honesty is a matter of individual analysis and most men have their own code of ethics, while quality merchandise is far too often considered as a mere smoke screen for exhorbitant prices.

Which leaves us with only the specialist proposition to fall back on.

You can't get away from the fact that folks do respect specialists. They may rave at some of their prices, but nevertheless they like to brag about what such and such a specialist said about their case and what he said they ought to do. No argument can hold water when a specialist has passed his judgment.

It can be that way in heat just as well as not. If something is wrong with my heating plant and a specialist has analyzed the trouble, no price cutter can come along and take the job unless he says the same thing. Most times they don't.

We're presupposing, of course, that the specialist is based on something more substantial than a mere name. Not only do we have to have the reputation, but we have to look the part. We've got to appear as though we know what it is all about. We've got to put on such a show that the prospect is impressed with our thoroughness and our knowledge.

If we leave that sort of a recollection the next fellow won't find it easy to sell heat on price and nothing else.

The Sixth Article On

Cost Accounting

IN our previous articles, we have stressed the importance of good cost records. We have discussed the estimating of jobs in such detail as would bring before you the advantage of building up your estimate and your actual costs on a comparative basis. We have shown material tickets and time cards and described their uses and purposes. We have illustrated the cost sheet and explained its purpose. We have listed such overhead accounts as we believe will best analyze your overhead.

We now wish to give you a complete list of accounts which would appear in your general ledger and explain their purposes. Previous articles have discussed several of these accounts in connection with other routine. References will be made to the previous articles from time to time. We hope you have preserved your copies of the ARTISAN so you can refer to the prior articles as you follow the current article.

An **"Account"** may be defined as a place, or ledger sheet, provided for the purpose of recording financial data pertaining to a given purpose.

A **"Ledger"** may be defined as a "group of accounts." Ledgers may be of several kinds. A "General Ledger" is that group of accounts pertaining to the business as a whole. It contains the general accounts, which contain the financial record of the business in its entirety. An "Accounts Receivable Ledger" would be one containing only the individual accounts with customers.

It is our purpose in this article to take up for discussion the General Ledger. The accounts found in a general ledger may be classified under four headings, as follows:

This article, the sixth of the series, lists the accounts which appear in the general ledger of any good sized furnace or sheet metal shop. Check these against the items in your present system and let us know how they compare.

Assets Accounts: Accounts relating to the ownership of the many kinds of property found in a business.

Liability Accounts: Accounts relating to the debts owed by the business.

Income Accounts: Accounts used for the purpose of recording sales under suitable headings, discounts taken and other revenues or earnings.

Expense Accounts: The classified accounts wherein are recorded the various kinds of expenses. You might use but one expense account in which would be charged all kinds of expenses as they accrue, but in such a case you would not be able to analyze your expenses without a great deal of unnecessary work. By the use of a well classified list of expense accounts you are better able to watch your expenses and eliminate unnecessary costs. In Article V, published June 7th, we gave a list of the recommended expense accounts and explained their uses.

Asset Accounts

Cash: This account is used to record the receipt of cash from the customers and other sources. We debit cash and credit the source of the cash received. As the cash is deposited in the bank we debit the bank and credit cash. If cash is disbursed from the office, we debit the disposition, or account affected by such disbursement and credit cash. The balance shown in this account must reconcile with the cash actually on hand in the office.

Bank: This account, like cash account, deals with our cash. Bank account is debited when we deposit money in the bank and is credited when we draw checks against our bank. The balance shown in this account must reconcile with our bank balance.

Joseph G. Dingle, C. P. A.

Accounts Receivable: This account is used to record transactions with our customers. The accounts with our customers are kept in a separate ledger, called Accounts Receivable Ledger, and this General Ledger account is a controlling account—controlling, in totals, the amounts of our transactions with customers. In other words, Accounts Receivable Account in the

General Ledger is the master account, and shows, in one total, the aggregate amount due by all our customers whose separate accounts are kept in the Accounts Receivable Ledger.

Notes Receivable: This account is used to contain transactions involving the notes receivable by the business. A customer may settle his account receivable by giving us a note, due at some future date, or, possibly, in monthly installments. The nature of the asset changes upon the giving of the note. We then debit Notes Receivable. As payments are received to apply on this note we debit Cash and Credit Notes Receivable.

Materials: This account records the inventory value of our materials at the beginning of the year, or on opening the books. Purchases of materials are charged or debited to this account, and, as materials are put into process or sold, as per our material tickets, we credit this Material Account. See a discussion of the use of Material Tickets in Articles 3 and 4, issue of May 10th and 24th.

Supplies: This account is quite similar to Materials Account in that it is an inventory account. Supplies account is used to contain such materials and supplies as solder, rivets, etc., which are used in production but are rarely charged against the customer as part of the direct costs.

Work In Process: This account is used as a holding place for work in process. Its use is covered in Article IV, in connection with the Cost Sheets, Material Tickets and Time Cards. We charge material and labor items to Cost Sheets. This account, then, may be called a Controlling Account. It controls, in total, our cost sheets. As jobs are finished we transfer the cost of such finished jobs to Cost of Sales by debiting Cost of Sales and crediting Work In Process.

CHART OF ACCOUNTS

Assets:
- Cash in Office
- Bank
- Accounts Receivable
- Notes Receivable
- Materials—Inventory
- Supplies—Inventory
- Work In Process
- Machinery & Equipment
- Furniture & Fixtures
- Delivery Equipment
- Proprietor's or Partner's drawing accounts

Liabilities:
- Accounts Payable
- Notes Payable
- Accrued Pay Roll
- Reserve for Depreciation

Capital Account:
- One account if individually owned business
- Separate account for each partner if partnership
- Capital Stock & Surplus if Incoporated

Income Account:
- Sales of Material
- Sales of Labor
- Discount Taken
- Interest Earned

Expense Accounts:
- Advertising
- Bad Debts
- Collection Expense
- Dues & Subscriptions
- Discount Allowed
- Delivery Expense
- Depreciation
- Freight & Drayage
- Heat, Light & Water
- Gas & Oil
- Interest Paid
- Insurance
- Indirect Labor
- Machine & Tool Expense
- Office Expense
- Rent
- Repairs
- Returns & Allowances
- Selling Expenses
- Taxes
- Telephone & Telegraph
- Traveling Expense

Cost of Sales—Material
Cost of Sales—Labor

Machinery & Equipment: This account is used to contain the investment in Machinery and Equipment used in the shop. See remarks under Reserve for Depreciation, also Depreciation.

Furniture & Fixtures: This account is used to contain the investment in furniture and fixtures for the office and show room. Like machinery and equipment, Furniture and Fixtures are subject to depreciation and you are referred to the remarks under Reserve for Depreciation and Depreciation.

Delivery Equipment: This account covers investment in equipment used for delivery service. Like Machinery and Furniture it depreciates.

Proprietor's (or Partner's) Drawing Account: This account is for the purpose of recording proprietor's personal withdrawals from the business—either in cash or materials. If proprietor works at trade, his salary for such work should be charged the same as an employe. He should fill out time cards and show where he worked and the hours.

Liability Accounts

Accounts Payable: An account which is a controlling account, dealing, in totals, with the transactions with creditors on open accounts. The accounts of the separate creditors are kept in a subsidiary record, called the Accounts Payable Ledger.

Notes Payable: This account is used to record transactions covering the borrowing of money on short term notes, usually from the bank.

Accrued Pay Roll: This account is used as a clearing account for pay roll transactions. When you pay the men, your entry will be "Debit Accrued Pay Roll and Credit Bank." Shortly after paying the men, you will build up an entry from the time cards, charging Work In Process, Indirect Labor, and such other accounts as are affected by the time cards, and Crediting Accrued Pay Roll. If your entry on paying the men was

charged direct to the accounts affected with corresponding credit to the bank, you would not have, in any one account your total expenditure for wages. This information is required for compensation insurance purposes. Through the use of Accrued Pay Roll account, we build up, in one account, our total for pay rolls. We also provide an easy means of properly disposing of labor costs to the accounts affected and at a time either before or after the rush of writing the pay checks.

Reserve for Depreciation: We own and use in the business Machinery and Equipment. This property wears out in time, and in order that its cost may be absorbed in operating costs, it is necessary that depreciation be considered. Instead of writing down the asset account, thereby destroying the historical record of its cost, we enter depreciation by debiting Depreciation (an expense account) and crediting "Reserve for Depreciation." To illustrate: We buy a truck, costing $1,000.00, which we expect to use for, say five years. The use, or wearing out, costs $200.00 per year (1/5 of $1,000.00). Instead of crediting Delivery Equipment each year with that $200.00 and causing that account to decrease each year from $1,000.00 to $800.00 to $600.00, we allow the Delivery Equipment account to stand at $1,000.00, which shows the cost of the truck. Our Reserve for Depreciation shows a growing credit balance and at the end of the second year, instead of having a balance of $600.00 in Delivery Equipment account, our two accounts show:

Delivery Equipment	$1,000.00
Reserve for Depreciation	400.00
Net Book Value	$600.00

These same remarks apply to our Machinery and Furniture accounts. We preserve in the asset accounts a true history of their cost, and charge their depreciation into operations by building up Reserve for Depreciation to gradually absorb the original cost during the usable life of the equipment.

Capital Account, or Accounts: If the business be owned by an individual, we would use a single capital account. If a partnership, we would use a separate capital account for each partner, in order that we might at all times be able to show each partner's equity. If the business be incorporated, we would use a Capital Stock Account to record the Capital Stock issued and a Surplus account to contain the profits left in the business.

In this connection, let me say that one of the most common mistakes made in partnership bookkeeping is to assume that just because the partners are equal owners at the beginning of business and are to share profits equally, their interests, or equities will at all times be equal. To illustrate: Assume two men form a partnership, and each contribute $5,000.000 in cash. The business starts off as follows:

Cash (debit)	$10,000.00
Capital — J. Smith (Credit)	$ 5000.00
Capital—W. Brown (Credit)	$ 5000.00

Thus far they are equal. As time passes the business makes some money, which is to be divided equally. Assume the profits to be $2,000.00. One half, or $1,000.00 is credited to each partner's capital account, bringing the totals up to $6,000.00 each. Still we are even. But, during the period in which we made the $2,000.00, J. Smith drew out of the business for his personal use $400.00 over and above his salary, while W. Brown drew $600.00. Smith, then, had a capital of $5000.00 plus $1,000.00 profit, less $400.00 drawn out, or a balance of $5,600.00. Brown would have a capital account of $5,000.00, plus $1,000.00 profit, less $600.00, or a balance of $5,400.00. Their participation in the profits continues to be equal, but Brown has drawn $600.00, while Smith drew but $400.00 Probably Smith will draw out more than Brown during the next period. In order that the record may be complete, it is well to use separate capital accounts.

The capital accounts are shown under Liabilities. The business itself owns certain property—the Assets. It owes all it owns. The Accounts and Notes Payable are owed to outsiders. The Reserves are related to the assets accounts which depreciate, and the business owes to the owner or owners (partners) the balance (Assets less Liabilities to outsiders and the reserves).

Income Accounts

Sales of Material, Sales of Labor: Sales are divided into Material and labor accounts for the reason that by so doing we can readily compare results. We should sell labor sufficient to cover the wages paid. Of course, you will say you sell labor at a higher rate than you pay for it. True enough, but you pay for a great deal of labor that is indirect—that you cannot charge direct to your customers. The same general principle applies in the matter of material. By the use of a Sales of Material account you can compare your sales with your material costs after adjusting for inventories.

By the use of the Cost Sheets, you build up your costs separately for labor and material. In estimating you use separate figures for material and labor.

Discount Taken is used to contain the earnings of the business from cash discounts taken for prompt payment of bills. It is an earning of the business but neither increases your sales price nor decreases your materials cost. It is an earning derived from the use of your capital or cash, for paying your bills within the discount dates.

Interest Earned is also an earning of the business, but, like Discount Taken, is not directly related to your business operations. It is rent received on money loaned. It is not a sales of material or labor, nor is it a reduction of your cost of doing business.

Expense Accounts

In Article V, published June 7th is a complete list of expense or overhead accounts, together with a

(Continued on page 29)

Simplified Development of 3-Piece, 90° Elbow

By **W. R. HAINES**
Contributing Editor

IN this week's pattern layout is shown the development of a 3-piece 90° elbow by projection of lines.

The first step in the development of this pattern is to draw the elevation or side view of the elbow as it will look when finished. In drawing this side view, make the radius of the throat equal in distance to one-half the diameter of the elbow. Then divide this side view into three parts to determine location of mitre lines. The first part is 22½°, the second 45° and the third 22½°.

In shop work, the first section only would be necessary, as the entire elbow could be made from the first piece of the pattern, by simply reversing this piece and using it to mark off the other sections on your material.

From radius point O, draw mitre line BG. Next, scribe an arc equal in diameter to the distance between points A and H on side view.

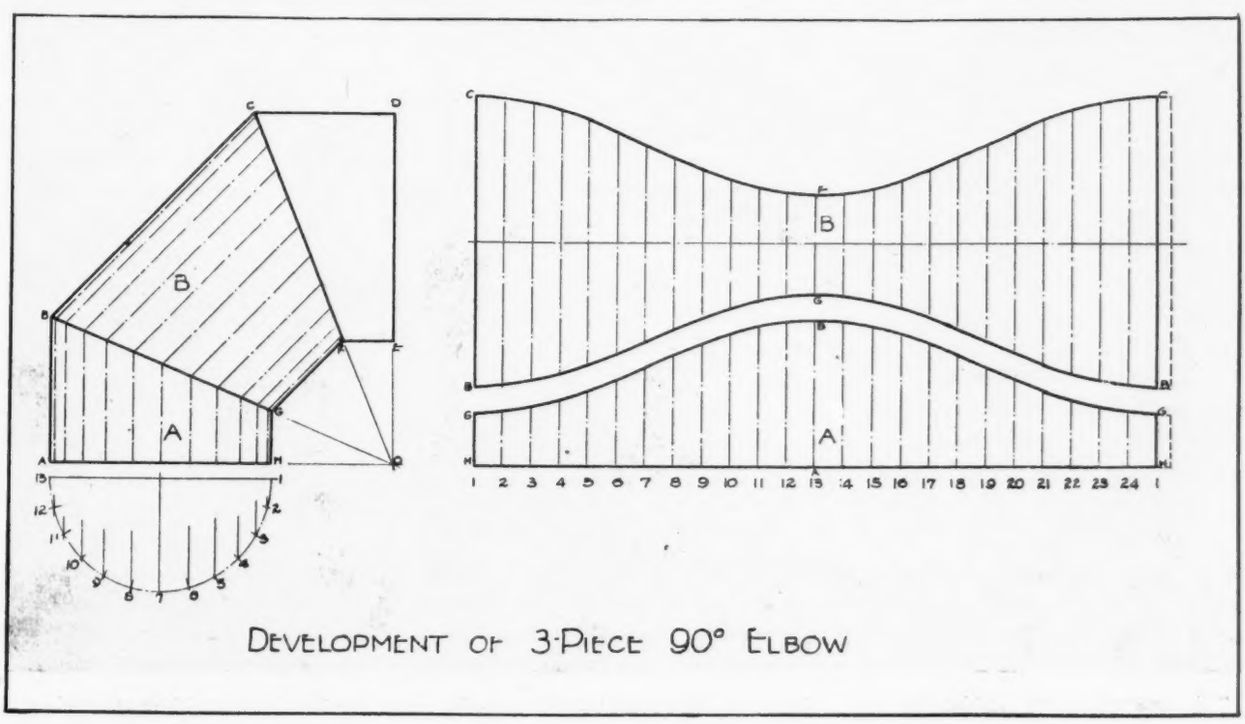
If you are making use of the patterns shown in every issue of American Artisan, we would like to hear how they work out. Our aim is to supply practical, simplified patterns which cut your shop and job costs.

Divide this arc into twelve equal spaces, or thirteen points. Next, project points on arc to intersect mitre line BG. Then determine stretch-out of your diameter, which is found by multiplying the diameter by 3.1416 (or by consulting the rusty steel rule found in most sheet metal shops*).

Divide stretch-out into equal parts, which will be twice as many spaces as in the elevation. From points 1, 2, 3, etc., on elevation, project lines to intersect points 1, 2, 3, etc., on stretch-out. When this is done, you will have view A with mitre line GBG and circumference HAH. This is the complete pattern for the first section of the elbow. The second and third sections are determined in exactly the same manner. The seam on this elbow is in throat and heel, but can be made on side, or from point 7, if so desired.

A lap-lock is shown on this development, but any lock can be used. I have found that using development of only one-half pattern gives a more perfect mitre, especially on a large elbow.

*A little steel wool and oil applied freely once a week will keep the steel rule bright and shiny and looking mighty slick.



DEVELOPMENT OF 3-PIECE 90° ELBOW

An Out-of-the-Ordinary Heating Plant Using A COMBINATION SYSTEM

AS the message of automatic, air conditioned heating, "gets across" with the American public, the demand for heating system providing all the desirable features home owners are reading about is becoming more and more insistent.

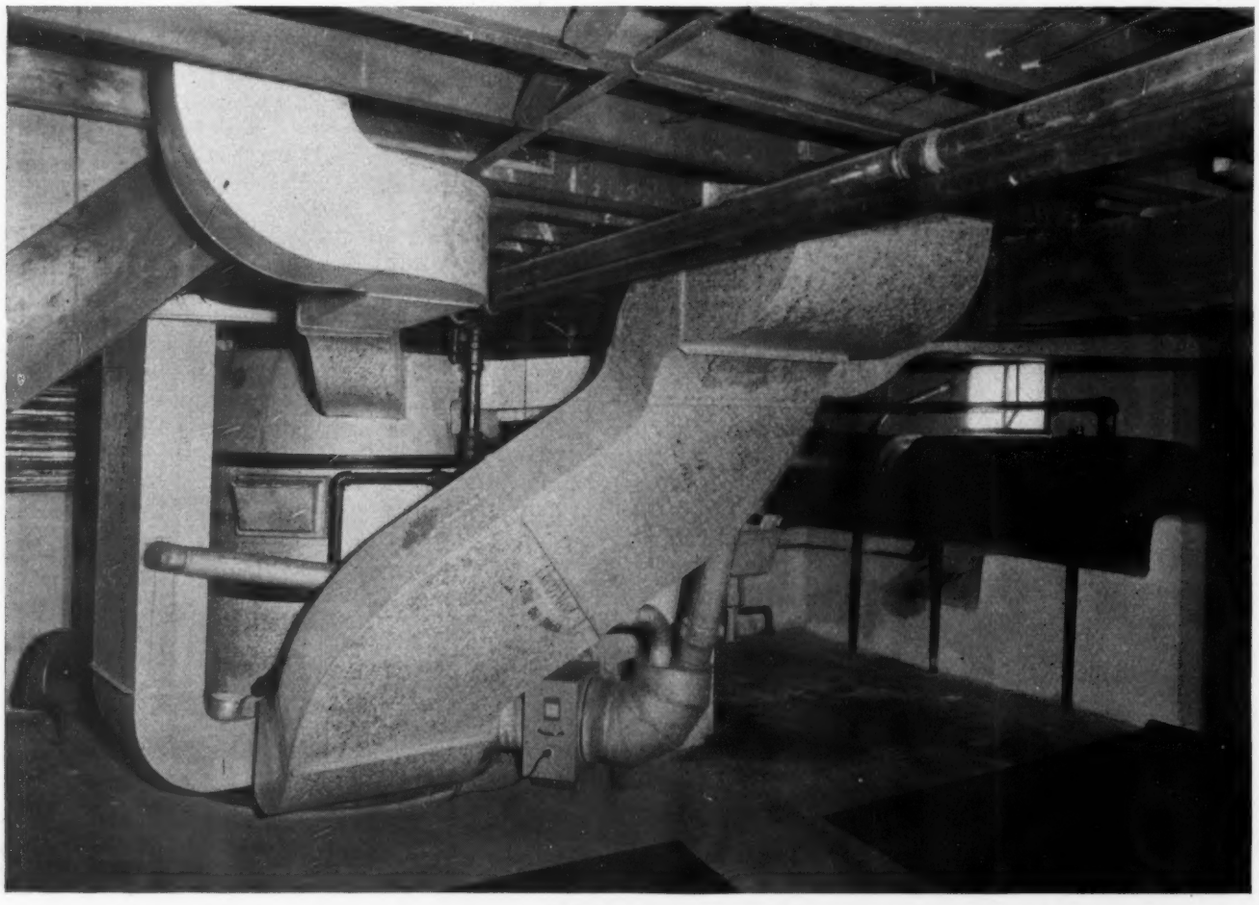
Heating men are being asked to explain the principles of this type of heating and are being called in to figure jobs of a size and quality unknown a few years ago. Every such installation gets wide publicity and serves as a "show" job for the heating men of the community.

Just such a job was installed in Pekin, Illinois, by the Pekin Hardware Company, furnace installers and heating specialists. The job has attracted much attention and has brought about increased interest in modern heating. The installation does not have any "tricky" features, but is, rather, a good straight job of warm air heating making use of accessories and equipment hooked up to insure the owner of automatic, "June weather in January."

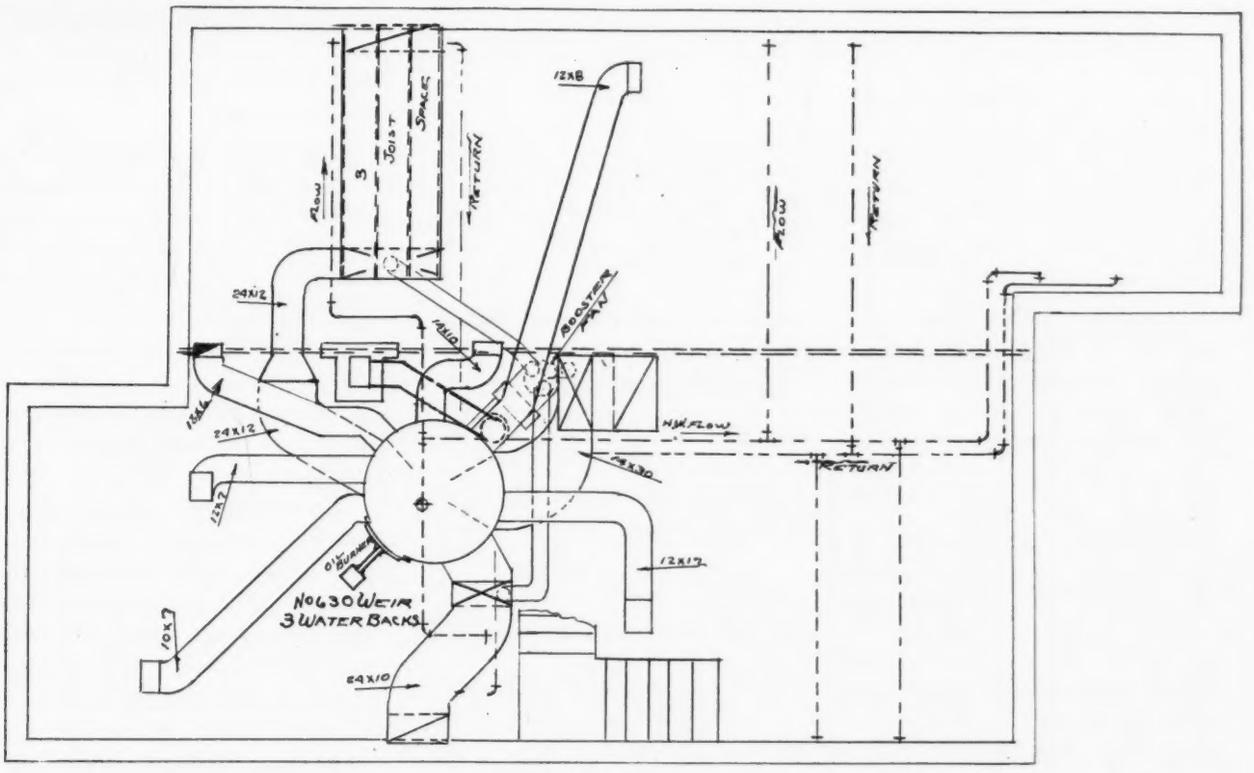
The backbone of the system is a Weir No. 630 furnace with three water backs. The heat is provided with an Oil-O-Matic oil burner, an A-C booster fan and an automatic humidifier. The oil burner is controlled by an automatic bonnet thermostat operated from a first floor thermostat.

One of the most interesting features of the job is the fact that the second floor of the house and the sunporch on the first floor are heated by hot water radiators from a coil taken off the furnace and heated from the furnace fire.

The house is a comparatively large one with ten rooms divided as follows: five rooms on the first floor and five rooms on the second. All of the rooms are large and with



This view shows the combination plant. The fan and oil burner appear clearly. Note the flat ducts and hot water lines



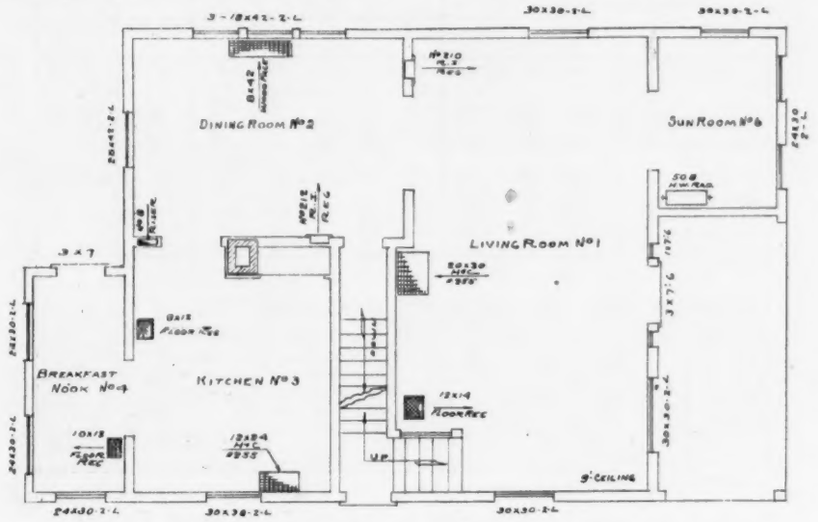
The layout of the system. The system is well balanced with short runs and compact arrangement of ducts

the exception of the kitchen and bath have at least two exposures.

The installation of the warm air side of the system was a piece of excellent salesmanship, as in such jobs it is very easy for the job to go "water" unless the heating contractor is up on his toes and does a solid piece of selling. In this job the warm air man not only sold warm air, but he sold along with it a duct system of conveying the air, an automatic oil burner and humidifier and a fan to insure circulation.

In designing the layout the contractor worked with the furnace manufacturer, the Meyer Furnace Company of Peoria and together these agencies designed a system which has proved highly satisfactory to the owner.

The striking feature of the basement layout is the flat duct system. With the exception of a couple of small return air pipes to the booster fan, all the leads are of the flat duct type and are carried up against the ceiling or compactly along the furnace casing. This has given the owner a clear basement with plenty of head room and a fine looking heating plant. Use of the oil burner has eliminated the coal room and so throws more room into usable space.

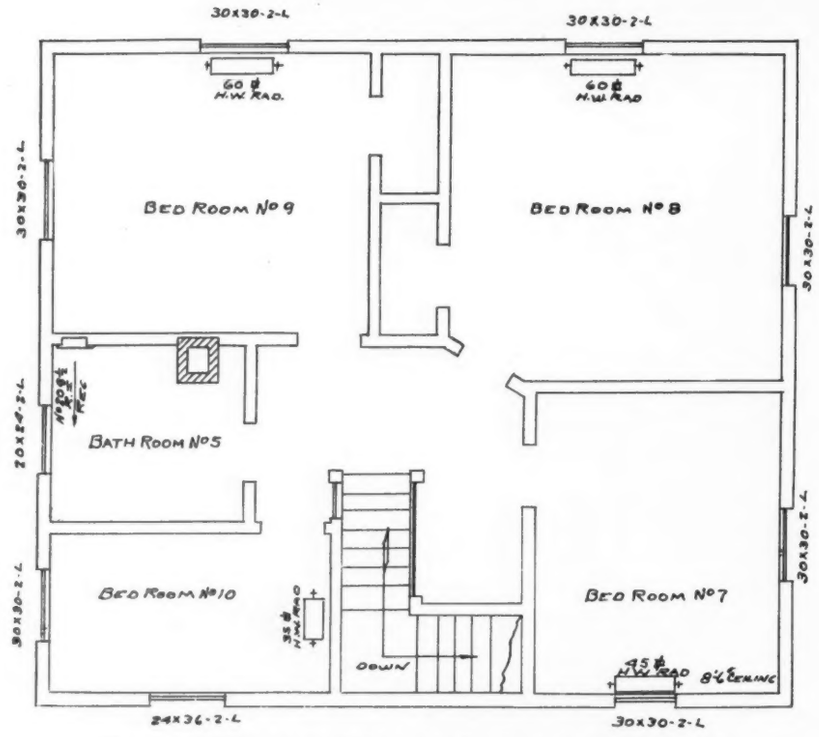


The first floor plan showing location of return air grilles and warm air registers

Because the second floor is cut off from the furnace, the system is very compact. Three cold air returns are used, bringing cold air from the living room, dining room and kitchen. The total amount of cold air returned to the furnace is 948 square inches.

The longest cold air run is the one from the dining room. The cold air face for this room is in the floor under an outside window. The air is carried through three joist spaces to a transition shoe where a square duct drops it down to a sloping duct 12 by 24 inches where it is taken into the casing.

The cold air return from the living room is brought down from the floor through one 90 degree and one 45 degree elbow joined into a duct which slopes into the cold air shoe. This duct is 14 by 30 inches providing an area of 420 square



The second floor plan. Only the bathroom is warm air heated

inches. This duct shows plainly in the foreground of the photograph.

The kitchen cold air return is the smallest of the three, being 10 by 24 inches providing an area of 240 square inches. This return is carried under the joists through a curved duct to a rectangular duct which drops the air into a cold air shoe.

The warm air side of the system is equally interesting. The living room which has a cubical content of 3834 cubic feet and a total exposure of 550 requires a basement leader area of 149 according to the standard code rating tables. Because the living room has one long dimension two warm air leads were run into it; one into each inside corner. It will be noticed that the one at the foot of the stairs is a floor register while the other is a baseboard type. The floor register was connected into a 12 by 12 inch duct with an area of 144 square inches, while the baseboard register was connected into an 8 by 12 duct with an area of 96 square inches. These give a total of 420 square inches.

The dining room is heated by a 10 by 14 inch duct exhausting through a baseboard register. This is on one inside wall, while the cold air is under the outside window. The kitchen is heated by one 7 by 12 inch duct opening through a 9 by 12 floor register in an opposite corner from the cold air face. The breakfast nook has one 10 by 7 inch duct and no cold air return.

Only one warm air riser is carried to the second floor. That riser heats the bathroom with a 12 by 6 inch basement duct opening into the room through a baseboard register. All the other rooms of the upstairs are heated through hot water radiators.

From the information given it will be noted that the standard code methods of figuring pipe areas was used for the warm air system. On the other hand the B.t.u. method was used to figure the amount of radiation required for the upstairs rooms.

The engineers assumed that every square foot of direct radiation puts into the room 150 B.t.u. To arrive at the amount of radiation, therefore the B.t.u. loss of each room was divided by 150 to give the square feet of radiation required. The water backs inside the combustion drum were figured large enough to take care of any loss in the mains.

The radiation used in each room is as follows: sun porch, 8,000 B.t.u. loss divided by 150 equals 53 square feet radiation, No. 7 bedroom 51 square feet, No. 8 bedroom 58 square feet, No. 9 bedroom 55 square feet, No. 10 bedroom 41 square feet.

With the exception of the small bedroom all radiators were placed under outside windows.

The accessories on this heating plant include a Williams Oil-O-

(Continued on page 29)

CONTRACTOR: PEKIN HDW. CO. PEKIN, ILL. OWNER: MR. POWER PEKIN, ILL.

CEILING HEIGHTS: 1st FLOOR 9'-0" 2nd " 8'-6" 3rd "

STANDARD CODE FORMULA
DIVIDE GLASS SURFACE BY 12
EXP. Wall " " 400
" CEILING " " 200
CU. CONTENTS " " 800
OUTSIDE DOOR CONSIDERED GLASS SURFACE

MULTIPLY TOTAL BY: 9 For 1st Floor; 6 " 2nd "; 5 " 3rd "

Add For Unusual Exposure: Bsmt. 10%; Sun Porch 10%

ROOMS	NUMBER	EXPOSURES Glass	Wall	Ceiling	CUBICAL CONTENTS	Glass Div. by 12	Wall Div. by	Ceiling Div. by	Co. Cont'ts Div. by 80?	Totals	Basement Leader Area	Size Pipe Used	First Area Used
LIVING ROOM	1	60	388	107	3834	5	6½	1	1½	16½	149	12x12	144 Sq. In.
DINING "	2	58	172		1350	4½	3		1¾	9	81	14x10	140
KITCHEN	3	19	89		1170	1½	1¼		1½	4½	38	12x12	84
BREAKFAST NOOK	4	69	120	55	495	5¾	2	½	½	8¾	77	12x10	70
BATH ROOM	5	12	43	49	417	1	¾	½	½	2¾	24	14x12	72
										B.t.u.			
SUN PARLOR	6	57	137	55	495	4¾	2¼	½	½	8000 ÷	150 = 53	3 Pc.	RAD.
BED ROOM	7	38	140	110	935	3¼	2¼	1	1¼	7750 ÷	150 = 51	"	"
" "	8	38	158	150	1275	3¼	2¼	1½	1½	8750 ÷	150 = 58	"	"
" "	9	38	149	120	1020	3¼	2½	1¼	1⅛	8250 ÷	150 = 55	"	"
" "	10	36	109	66	561	3	1¾	¾	¾	6250 ÷	150 = 41	"	"
									TOTALS				

PIPE AREAS			
8	50	22	380
9	63	24	452
10	78	26	530
12	113	28	616
14	154	30	706
16	201	32	804
18	254	34	908
20	314	36	1018

WEIR FURNACE RATINGS						
SIZE	Cooler Area Sq. In.	Ratio Hg To Cooler Surface	Casing Dia.	B. T. U. Capacity	Pipe Area
421	182	41.2	48	51800	381
634	258	33.9	52	73600	541
638	336	29.2	54	94100	692
630	463	26.4	58	119000	875
633	551	22.7	65	138000	1015
636	682	19.6	67	160000	1180

C. A. RETURNS From Room	No.	PIPE Diam.	Area
LIVING ROOM	1	14/30	420
DINING "	2	14/24	288
KITCHEN	3	10/24	240
		TOTAL	948

SUMMARY: Warm Air Req. 897 Sq. In.; Wm. Air Used 906 Sq. In.; Cold Air Used 948 Sq. In.; Date 6-14-30; Plan Number 29-280

*Use Factors Shown in Table "A," Standard Code. (See Reverse Side this Sheet).

THE MEYER FURNACE CO., PEORIA, ILL.

The data sheet used by engineering department of The Meyer Furnace Co., Peoria, Ill. The exposures and sizes are figured by Standard Code

There Has Never Been More Crying Need for

ORGANIZATION AND COOPERATION

J. E. MERRICK

Here is the very able address of the now past president. His analysis of present conditions and future possibilities will bear reading.

A year has passed since the twenty-fifth annual convention at Baltimore, and we are again assembled to discuss the problems that confront us as sheet metal and heating contractors; to make and put into force plans by which we hope to improve and elevate the industry in which we are engaged.

The year has been an eventful one, due principally to the tremendous falling off in building construction. This brought on a greatly increased and ruinous competition, not only on the part of those already engaged in the sheet metal and heating business, but from many of our former employees, who, being temporarily out of work, started in the sheet metal business.

In our eagerness to maintain volume, it appears many of us paid small attention to overhead costs, and sacrificed an already small profit. With practically one-half of the year 1929 gone at the time of our last convention, a period in which conditions were only moderately fair, the shrinkage in building construction increased as the year advanced, with the result that the last six months of 1929 were indeed discouraging. The collapse of the stock market in November last, from which it appears business has not yet recovered, played its full part in demoralizing business of all kinds. Efforts were put forth by the executive head of our Government, through the Chamber of Commerce of the United States, and other agencies, to encourage and stabilize all business. Yet, conditions are still far from satisfactory. It will require serious thought and co-operative action to overcome the present depression. Our united efforts should be so directed. Plans should be made that will enable our national association to properly support any and all measures for the elimination of all business practices except such as are sound, fair and honorable business.

Standard Practice in Sheet Metal Work, the book upon which the Trade Development Committee of the National Association spent much labor and money, the completion of which we so anxiously awaited, became a reality in September, 1929. As a full report will be made upon this book by the chairman of the Trade Development Committee and Secretary Markle, I shall refrain from making comment thereon, except to say that the sales of the book have been very disappointing. It appears to me that the members of the national association and the manufacturers and wholesalers of sheet metal fail to realize the beneficial effect an extensive and proper distribution of this book would bring to the sheet metal industry.

It also would certainly be ungrateful upon my part if I failed to remind you that the completion of this book was only made possible through the untiring efforts and generosity of the chairman of the Trade Development Committee, Mr. George Harms; he loaning the money necessary to complete the book. This National Association is deeply indebted to Mr. Harms and every effort should be made to speedily repay this loan.

In July, 1929, in the hope that I would be able to create some interest among local and state associations, I directed a letter to every secretary listed in the *Contractor,* enclosing a questionnaire as to what the national association could do to assist local association work. Out of the 107 listed, I received only 23 replies. A second letter featuring the completion of the Standard Practice in Sheet Metal Work was mailed in November. From this I received orders for about 10 books. While I realize that the position of secretary in a local association is a more or less thankless job, the vitality of any local association depends a great deal upon the activities of the secretary. May I recommend and urge each one to give his best efforts towards furthering the interests of his local and national association.

The position of National Secretary is a very trying one, and requires the service of exceptional ability, that pays no attention to the number of hours worked each day. We are fortunate indeed in having W. C. Markle as secretary of this association, who, possessing all the requirements of a reliable, competent secretary, fills the position as few men could. I wish to extend to him my sincere appreciation for the very able manner in which he has conducted the affairs of the association.

During the year I had the pleasure of attending district meetings of sheet metal contractors in Bloomington and at Columbus, Ind.; the Indiana state convention at Indianapolis; the Pennsylvania state convention, at Beaver Falls; the Illinois state convention at Springfield; the New York state convention at Utica; and the United Roofers'

(Continued on page 29)

Placing the fluted sheets on the front of the ornament. The iron and wood structure is to hold the sheets

A FLAG POLE ENCLOSURE

In the Modern Mode of Metal Ornamentation

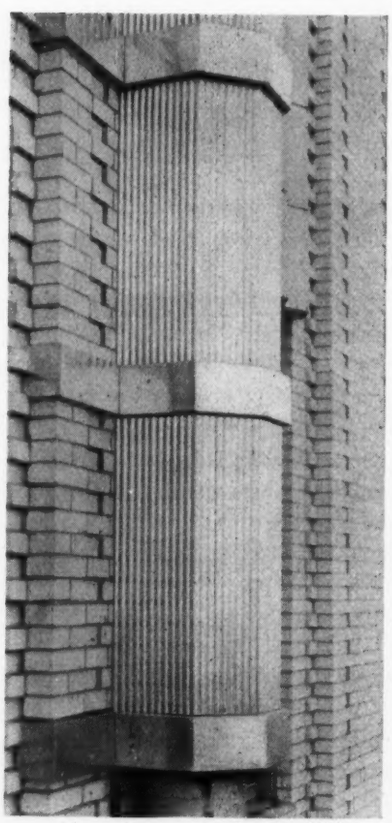
THERE is a noticeable trend among architects these days to use metal in one form or another as trim on the new buildings. This trend to metal has been going on for some time, but within the last two years it has become especially noticeable. In some cases, like the Chrysler Building, use of metal has really meant the sheathing of entire walls and spires in metal, but aside from these jobs there is a large amount of metal going into trim on small projects not requiring a great quantity of metal.

A typical instance of this kind of a job is the ornamentation on the Squibb Building in New York City. This is one of the new office buildings, but is not an outstanding building. It is an attractive structure, much like hundreds of similar buildings being built in cities all over the country.

The top of the building has a setback penthouse two stories high. Up the front of this penthouse runs a flag pole, quite high and built of iron. Inasmuch as it occupies a location almost flush with the front of the building the architects decided to dress it up. They consulted Hermann and Grace, sheet metal contractors of Brooklyn and in conjunction with the sheet metal contractors worked out an enclosure and ornament of aluminum which is both good looking and permanent.

This ornamentation is in the form of a flag pole enclosure around the pole up to a point level with the penthouse roof where a flat topped crest of fluted sheets runs out along the coping for a little over 5 feet. This is topped with a triple collar of metal, also fluted.

The pole enclosure is five sided



The lower end of the enclosure. The straps are only ornamental, iron bands under them hold the sheets

and is 1 foot 9 inches from side to side. Each of the sides is fluted with 1-inch flutes formed by machine in the shop. The entire section between bands is formed out of one piece, fluted and shaped to a five-sided cross section.

The sections were held in place on the wall by bands of metal 6 inches wide and some 51 inches from end to end. These bands were not fluted and were held to the wall by expansion bolts.

The bands were turned over along the edges so that they stand out from the pole enclosure about 1 inch. The ends were turned back so that the end makes a right angled turn following a set-back of the brick work.

The joints between sections of the fluted enclosure were all welded on the job.

As can be seen in the drawing, there are five sections of enclosure beginning from the bottom. This enclosure does not run down to the roof, but stops short some 4 feet up. This cannot be seen from the street, of course.

Above the five lower sections, which are all the same height, there is a taller section which is flanked by a many ribbed siding which extends out from the enclosure a little over one foot. Still further out is the crest, which again is fluted.

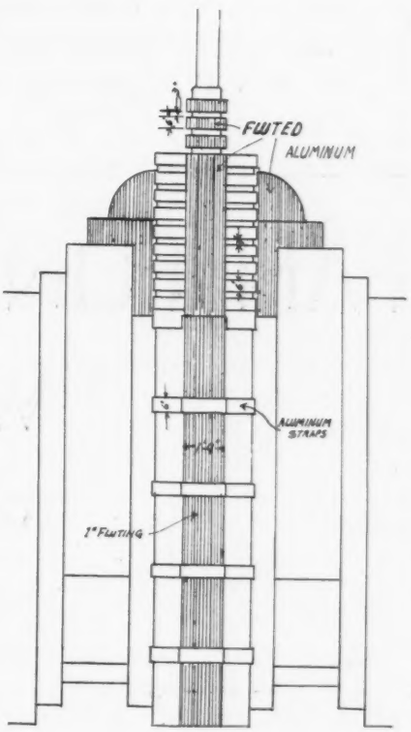
This top section is over 6 feet high and is so formed that 6-inch faces alternate with 3-inch depressed faces over the entire height. The sections of this facing were welded on the job. Above the facing is a series of three fluted collars which bring the enclosure to an end. The flag pole extends upward some 75 feet above this metal ornamental work.

These three top collars were made in two pieces for each collar. Each piece had four sides and a 3-inch spacing collar so that when assembled each fluted collar was separated from the collars adjoining by a plain collar of smaller diameter. The two pieces of each collar were locked with a flat seam and welded.

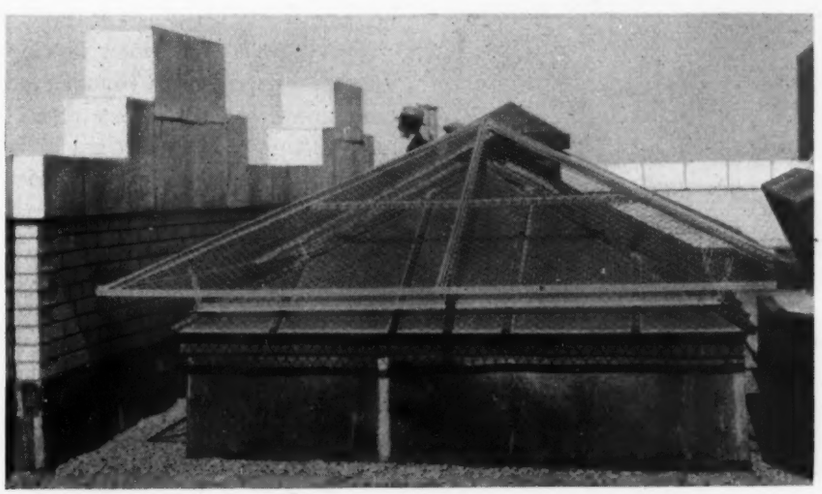
Where the metal surrounds the pole as it runs up along the wall the metal sections are held in place by fastening to the brick work. Above the coping line, however, the sheets are fastened to a specially built metal framework. This framework also serves as a brace for the flag pole. As can be seen from one of the photographs a frame of wood was built around and above the metal bracing to hold the back sheets of the crest. It was not much of a trick to fasten the front sheets in place, but to get the back and side ones placed was another matter. This was finally solved by putting in wood blocks to which the sheets could be screwed and the seams turned down.

All the aluminum used in the job was of 24-gauge and was formed up in Hermann and Grace's shop in Brooklyn. The welding was done on the job.

This job is not a large one from the standpoint of the amount of metal used. It is not an especially intricate job, either, and could very easily be formed up and installed by any good sheet metal man.



This drawing shows the design and construction of the flag pole enclosure. Though such jobs are small in quantity of metal used they are intricate enough to demand an excellent profit



One of the copper skylights with its protecting screen. The high flashing is of copper and so are the skylight ventilators

It does show, though, one thing —that ornamentation is coming into favor and gives a good example of what this trend will bring. This type of work brings good profits and opens up new fields for the sheet metal man.

This job has some very good examples of skylight work. These are wire covered and are made out of copper. The flashing which surrounds the skylights and which was used around the roof is also of copper.

Fans are the center of many live discussions these days. Their progress has been so rapid, however, that many of us have been forced to accept statements of ability, capacity, operation without having a background to check against. American Artisan believes that every furnace man should understand the fundamental principles behind all fan operation. We begin this study with a series of articles by G. A. Voorhees of Indianapolis. Mr. Voorhees is a well known engineer and has been conducting a very exhaustive study of fan fundamentals during the last few years. The results of this study are incorporated in this series. The intention of this series is to go back to the very beginning and see what fan work is all about. We invite your comment and your questions.

FAN FUNDAMENTALS [Part I]

With Particular Reference to the Use of Fans in Heating

By **G. A. VOORHEES**

Heating and Ventilating Engineer, Indianapolis, Ind.

Air Circulation in Warm Air Heating

Warm air rises for the same reason that a cork released at the bottom of a bucket of water will rise—because it is lighter than the surrounding fluid.

In a warm air heating system, a cubic foot of cold air entering the bottom of the furnace through the cold air recirculating duct is from 10 to 25 per cent heavier than a cubic foot of heated air which has passed through the furnace and is entering the warm air distributing pipes. This heavier, cold air pushes the lighter warm air upward just as water raises a cork.

The name, "gravity circulating system," is applied to such a heating plant because the air movement is due to the difference in weight (gravity) of the warm and the cool air.

Energy Required to Circulate Air

Tests at the Research Residence, University of Illinois, show that in zero weather the volume of air passing through the furnace and piping system is about three times the cubic volume of the house every hour.

G. A. Voorhees

Thus, in a house having 12,000 cubic feet of space to heat, the heating plant in zero weather, circulates about 36,000 cubic feet of air per hour, and since the weight of 1,000 cubic feet of air at 70 degrees is 75 pounds, the heating plant is moving an actual weight of 2,700 pounds per hour.

Resistance to Air Flow

An auto may be driven at high speed on a straight road, but it has to slow down to turn a corner.

The same is true of air flowing through a pipe—every bend in the pipe slows it down. This retarding effect of elbows and angles is caused both by turbulence and friction due to change of direction of flow.

Then there is the continuous retarding effect of friction against the sides of the pipe. A careful test (U. of I. Bul, 120) showed that in a 10-inch warm air leader, the air flow was reduced about 20 per cent along the walls of the pipe on account of friction.

A further retarding effect exists

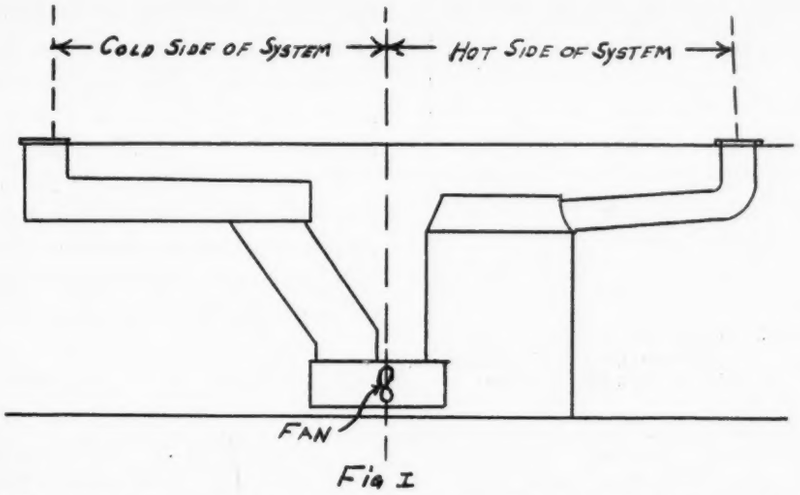


FIG. 1

When a fan is placed in a heating system it forms the dividing line between the hot and the cold side of the system. The fan does two things—increases the acceleration on the cold side by "pull" and builds up a pressure on the hot side by "force"

at each warm air discharge register. The coolest air in the room, being heavy, settles to the floor and the light-weight, warm air entering the room through the heat register, has to shoulder its way through this heavy, sluggish body of cool air. The repressing effect of this stratum of cool air on the warm air circulation is evident when we consider that the weight of a cubic foot of air at the floor line (temperature 65 degrees) is about 20 per cent greater than the weight of a cubic foot of warm air entering the room through the register at 175 degrees.

Furnace Fans

The frictional resistance to be overcome plus the weight of air to be moved has led to the development of the furnace fan to improve the service rendered by the heating plant.

Such a fan, which is usually placed at or near the furnace improves the air circulating efficiency in two ways:

With the fan located in its usual position in the cold air boot near the furnace as shown in Fig. 1, (a) the suction effect on the intake side of the fan accelerates air flow on the "cold side" of the system and (b) the pressure built up on the discharge side of the fan helps to drive the air through the "hot side."

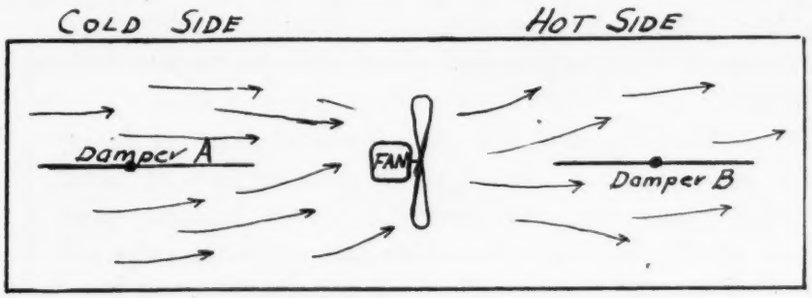


FIG. 2

This drawing shows an "ideal" system—one in which there is no friction to slow down the air movement. All the air handled by the fan moves through the system

To simplify a study of the fundamental principles involved in fan action in a furnace plant, we may substitute for the complete system consisting of return air ducts, furnace and warm air leaders, a section of pipe having two dampers with a fan between them (Fig. 2).

Damper "A" represents the resistance to air flow encountered on the cold side of the system and damper "B" the resistance on the hot side.

Both dampers entirely open (Fig. 2) illustrates an ideal (and hence impossible) warm air heating plant in which there is no frictional resistance to air flow on either the hot or cold side of the system. In such a case, the entire volume of air handled by the fan would obviously move throughout the system.

Figure 3 represents the condition equivalent to a well designed and properly installed plant with all pipes SHORT, STRAIGHT and of AMPLE (Standard Code) SIZE. The slight angular inclination of the dampers represents the relatively small resistance to air flow in such a plant. Almost all air handled by the fan passes on through the system and only a very small volume flows back around the fan to the suction side.

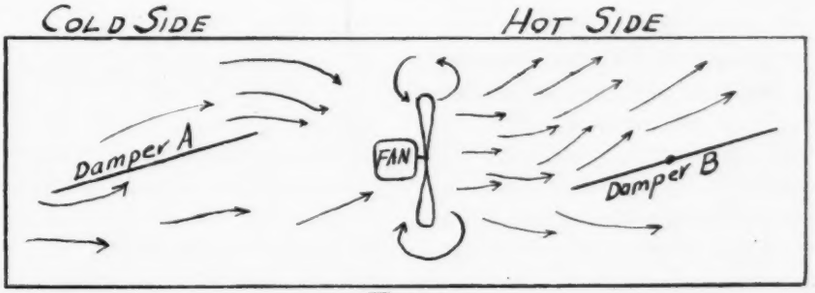


FIG. 3

This typifies the average GOOD system in which all runs to stacks are short and straight and of ample size. There is small resistance to air flow. Note air eddies around fan. These kill pressure

Figure 4 with the dampers closed a little further represents the AVERAGE system where a fan is most needed. The resistance both on the suction (cold air) side and discharge (warm air) side is greater. Consequently the fan drives a less volume of air THROUGH the system and a

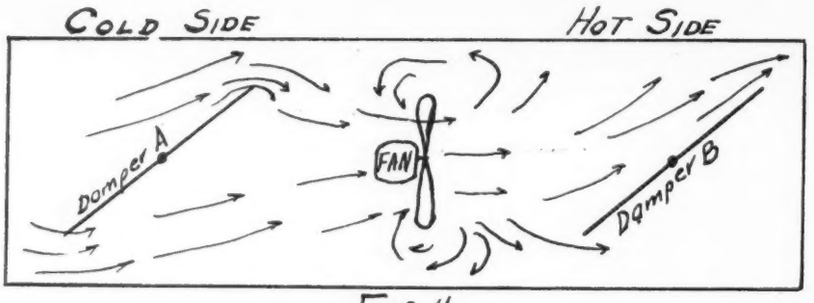


FIG. 4

This illustrates conditions in a commonly found system where a fan is needed to force air through the pipes. Resistance is greater on both hot and cold sides of the system. The air eddies around blade ends kill pressure

greater volume short-circuits AROUND the fan to the suction side.

A comparison of these three diagrams shows that as the resistance to air flow increases, the efficiency of the fan in relation to the plant drops off rapidly.

From the foregoing it is evident that as the resistance to air flow increases, some means must be provided to stop the passage of air from the discharge or pressure side to the suction side of the fan if the unit is to operate efficiently (Fig 5).

Types of Furnace Fans

Fans operating on the principle shown in Figs. 2, 3 and 4, are called "boosters" because they merely accelerate or "boost" the normal gravity circulation.

A fan having *no possible air passage* from the discharge side to the suction side is known as a "pressure-type" fan. Fig. 5 illustrates the principle.

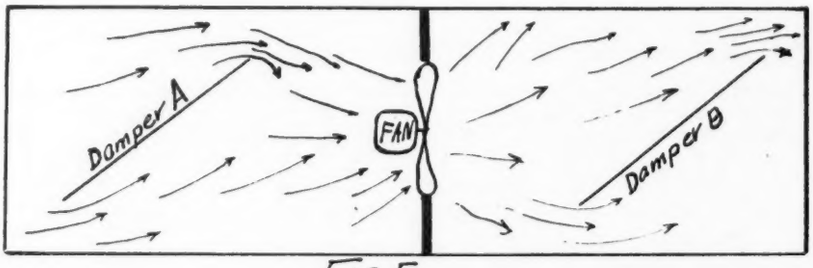


FIG. 5

This illustrates the type of fan installation in which there is absolutely no opening for air to circulate around the fan. This is the true "pressure" type of fan. Air cannot escape back around the fan, so all air "pulled" through the fan is "forced" through the furnace

Booster-Type Fans

The advantages of the simple booster-type fan are its relatively low cost and its ease of installation. On the other hand, it does not and cannot operate efficiently if there is any appreciable resistance to air flow either in the return air ducts or the warm air piping system.

Even though it is inefficient in many cases, it usually does increase the air flow through the system to some extent. Unfortunately the increased air flow is too often to rooms close to the furnace especially if they have large pipes and the benefit to the system as a whole is slight.

In compact, well constructed residences and other buildings of moderate size, it usually gives satisfactory results with furnace centrally located and with both warm air and return air pipes SHORT, STRAIGHT and of AMPLE SIZE.

The booster-type should never be used in system having air filters or register dust catchers because these

FIRM NAME PLATES

Every heating man who puts in a modern warm air heating plant ought to have enough pride in his craft to want everyone who sees his jobs to know who put the plant in.

The thought behind such a name plate is identical with the pride which induces bridge builders, structural contractors and other artisans to put their name plate on their structures.

How many of you warm air heating men use such a name plate to designate your jobs? If you do send us in a sketch or a photograph of your plate, we are going to publish them with the idea that every heating man ought to follow suit. Tell us what you make the plate out of, what colors it has and where you put it. And by all means tell us of any results you have gotten from this rightful designation of your artisanship.

cleaning devices impose too much resistance to air flow. Only a pressure-type fan will maintain the desired air delivery under such conditions.

COST ACCOUNTING

(Continued from page 18)

description of their uses. We will not go over them again here.

In the April 12th issue of the ARTISAN we gave several transactions incidental to starting in business. In the April 26th issue, we presented ledger sheets, showing the transactions posted to the proper accounts. These illustrated transactions are but a few of the many which occur in a business during the day. They serve however, to show the purpose of bookkeeping—which is to keep up with your money no matter where it goes or what form it takes. It is constantly and rapidly changing its form and position.

Cost of Sales—Material: This account is used for the purpose of computing periodically the cost of the material sold during the period. These costs arise from the Cost Sheets and Material Tickets. See Articles 3 and 4 for a complete discussion of the Cost Sheets. As work is completed and charged to the customer, we debit Accounts Receivable and credit Sales of Material and Sales of Labor. We then turn to our cost records and build up the data covering the cost of the sales and debit Cost of Sales—Material and Credit Work In Process.

Cost of Sales—Labor: This account is quite similar to Cost of Sales—Material, except that it pertains to Labor instead of Material.

Now, in this article, and in Article V, we have named the accounts required to keep up with the business activities of a Warm Air Furnace Installer. We have also explained the purpose and operations of these accounts. Planning a set of accounts for a business may be compared with the preliminary steps in designing a home. In a home, we must have a kitchen, a dining room, a bathroom, and, as desired, living rooms, library and one or more bedrooms, according to the size of the family. In planning a set of accounts for an industry like the Warm Air Furnace Installers, we must have certain accounts to record the basic or principal activities and, like the bedrooms, we can add to or deduct from the minor or secondary accounts, such as our expense accounts. We can throw all kinds of expense into one general expense account, or, preferably, we can use a properly classified set of accounts each recording or containing a specific kind of expense. The more we divide up our expenses, the easier it is for us to watch them for unnecessary expenditures.

The accompanying chart of accounts presents in compact form all accounts mentioned in this article or in Article V.

COMBINATION SYSTEM

(Continued from page 22)

Matic oil burner, an automatic humidifier and a booster fan. The oil burner is connected to a pair of tanks supported along one of the outside basement walls. In the arrangement of the plant the fire door was placed against a wall so that the oil burner would be out of the way but would still be accessible. This gives added clear floor space around the furnace.

The fan is an A-C booster fan hooked into all three of the cold air returns through small auxiliary pipes. These pipes were taken off the main cold air return at a point some distance off the floor so that the movement of cold air would always be downward toward the fan. The three small lead in pipes converge at the end of a round pipe elbow which is connected into the fan housing. The fan was placed in the system so as to insure increased circulation whenever necessary, but is manually controlled and does not have to be run when the weather is such that gravity heats the house.

The humidifier is of the direct water line connected type which requires no attention. The amount of humidity wanted is determined and the humidifier set to deliver this percentage. The water is brought in through the line and no attention is required beyond a little periodic cleaning of the pan.

The installation is an exceedingly neat job all the way through. Use of the ducts provided clear head room and the system is compact and leaves free large floor areas in the basement.

MERRICK ADDRESS

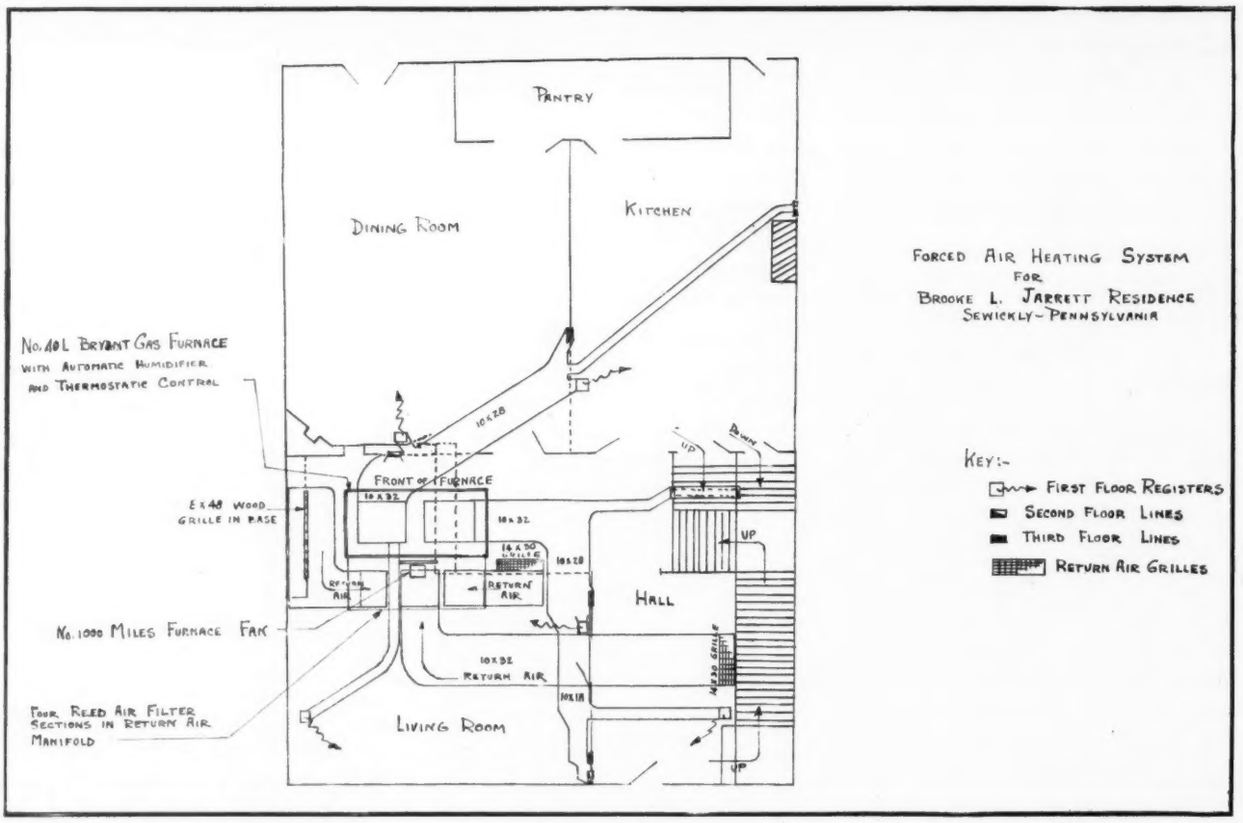
(Continued from page 23)

convention at Louisville. At each of these meetings the attendance was very good, and despite the fact that building operations were decidedly off, a spirit of enthusiasm and optimism was apparent. District meetings in thickly populated states should be encouraged, because the oftener competitors meet the better acquainted they become.

In selecting dates for future state conventions, it is recommended that care should be taken so that no two state conventions are held in the same week.

I desire to express my sincere appreciation to the members of the national association for having honored me as president of the organization, to the officers for their cooperation, and to the various committees for the prompt and willing manner in which they discharged the duties laid upon them.

As at no time in the history of the sheet metal and warm-air heating industry has there been greater need for organization and co-operation than at present. Let me appeal to all present—and may this appeal in some manner be conveyed to every sheet metal contractor in this country—that true and loyal support shall be accorded to the incoming administration of this association.



This is the layout of the forced air heating system. Note the compactness of system and the excellent distribution of the ducts. Practically all the ducts and the heater are on one side of the basement, leaving the rest of the basement free

ENGINEERED HEATING

B. L. Schwartz, Heating Engineer, Is Selling Engineered Heating to Pittsburgh Home Owners

HEATING men generally are hearing a lot these days about gas heating. This has been especially true since the natural gas pipe lines began to crawl across the country from the fields of the southwest. Already these lines have entered many of our large cities and when the ambitious plans now on the drafting boards are perfected, natural gas as the heating element in warm air heating is going to be a force to be reckoned with.

Use of this fuel will open new fields for the warm air heating man, in fact the advent of this fuel has already done just that thing in many localities. To meet the demand for this type of heat there is coming into being a new class of warm air heating man—the heating engineer—who must be able both technically and from a selling standpoint to sell this type of equipment to the owners of our finest homes.

This trend is indicated in the work being done in Pittsburgh by B. L. Schwartz, who operates under the name Schwartz Furnace Company. This heating engineer is a graduate mechanical engineer who has gone into warm air heating and has already installed numerous large jobs throughout his community. In all cases gas has been the fuel used.

One of the jobs has been under observation for several months and gives an excellent picture of what can be expected from this new type heating. The job is in a large, ten-room frame residence which was formerly heated with a combination gas furnace and coal furnace. The house is not insulated and is exposed on all four sides. The heating bills under the old system ran from $260 to $300 for a season. Since the new equipment has been put in the cost has been reduced to $175.00 a season.

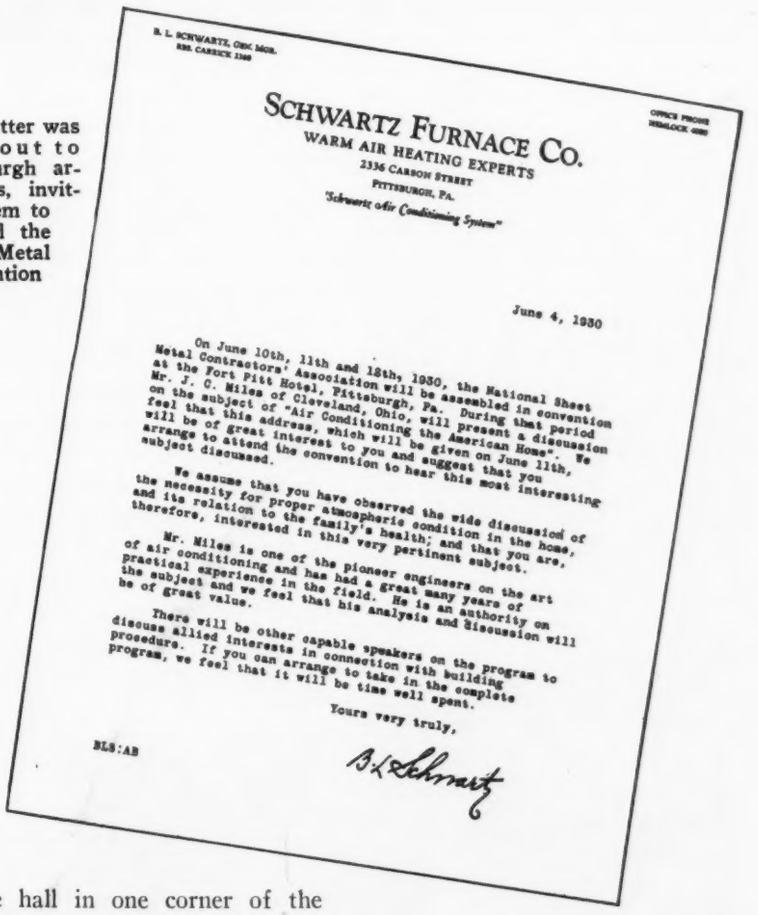
The system is typical of the work being done by this heating engineer. In addition to using gas as a fuel, he installs flat ducts wherever possible, insures adequate change of air and circulation of warm air

through use of a fan system, always uses automatic control for both the furnace and the fan, and finishes his jobs in such a manner that the basement is a pleasure to look at.

The gas furnace used is the Bryant and is installed in sections according to the number of B.t.u.'s of heat required. This job uses four sections. The fan behind the system is a Miles Number 1000. The air is filtered through four Reed filters of the steel filled wire units. These units are taken out and cleaned periodically as needed.

This installation is in a house with some 121,814 B.t.u. heat loss. To meet this loss four gas heating elements each with a capacity of about 35,000 B.t.u. were installed in a warm air furnace to give a total input of 140,000 B.t.u.

The house is a three story affair with four large rooms on the first floor and two rooms on the third floor. Mr. Jarrett, owner of the house, is a distributor of mill equipment and so knows something about heating equipment and problems. His judgment of the system rated it as excellent and his choice, he says, has been more than justified.



B. L. SCHWARTZ, GEN. MGR.
838. CARRICK 1349

SCHWARTZ FURNACE CO.
WARM AIR HEATING EXPERTS
2336 CARSON STREET
PITTSBURGH, PA.
"Schwartz Air Conditioning System"

OFFICE PHONE
HEMLOCK 4000

June 4, 1930

On June 10th, 11th and 12th, 1930, the National Sheet Metal Contractors' Association will be assembled in convention at the Fort Pitt Hotel, Pittsburgh, Pa. During that period Mr. J. C. Miles of Cleveland, Ohio, will present a discussion on the subject of "Air Conditioning the American Home". We feel that this address, which will be given on June 11th, will be of great interest to you and suggest that you arrange to attend the convention to hear this most interesting subject discussed.

We assume that you have observed the wide discussion of the necessity for proper atmospheric condition in the home, and its relation to the family's health; and that you are, therefore, interested in this very pertinent subject.

Mr. Miles is one of the pioneer engineers on the art of air conditioning and has had a great many years of practical experience in the field. He is an authority on the subject and we feel that his analysis and discussion will be of great value.

There will be other capable speakers on the program to discuss allied interests in connection with building procedure. If you can arrange to take in the complete program, we feel that it will be time well spent.

Yours very truly,

BLS:AB

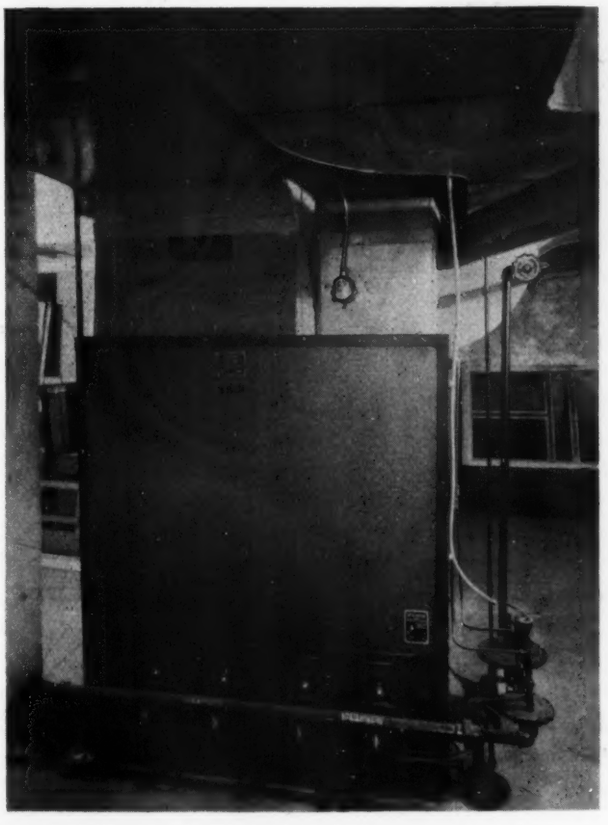
B L Schwartz

This letter was sent out to Pittsburgh architects, inviting them to attend the Sheet Metal convention

The hall in one corner of the first floor is heated by means of a branch taken off a 10 by 18-inch duct. This branch carries about one fourth the air moving through the main duct. At the foot of the stairs a floor grille connects into 10 by 32-inch return air duct which follows the floor beams, but under them, to the furnace.

One warm air intake is taken off the hall duct and carried through a floor register into one side of the living room just off the hall door. A third warm air lead connects from this same duct to a stack running to the second floor while two other leads from the end of this same line run to the second and third floors.

A small individual duct introduces warm air through a floor register into the opposite side of the living room. Both these warm air ducts are exhausted through a 14 by 30-inch floor grille connecting into an individual return air duct which comes in over the fan. A second return air grille is located in the base of a built-in seat along the outside wall. This connects



A view of the heater. The ducts are all painted and placed compactly against the heater and the ceiling

These heaters are installed in sections according to the number of B. t. u.'s required. The fan is controlled by a room thermostat and a furnace thermostate placed in a warm air duct. The fan can operate when the burner is off

through a short duct with the fan cold air chute.

One warm air floor register heats the dining room. This register is taken off a long trunk line which runs diagonally across the basement to the outside wall where it connects into a second floor stack. No cold air return is provided from the dining room.

The trunk line duct which supplies the dining room is divided into three branches where it crosses under the dining-kitchen partition. One branch runs up this partition to the third floor. A second runs across to a second floor riser, while the third supplies warm air to the kitchen floor register. No cold air return is used from the kitchen. One short lead off the middle trunk line duct, runs over to the back stairs and uses the stair partition to get up to one of the second floor bedrooms.

All of the registers are metal excepting the one in the living room which exhausts from the window seat. This grille is wood and is painted to match the woodwork.

One feature of this job is the compactness of the system. All the large ducts are short, while long runs are taken care of by small ducts having good velocity because of the fan behind the warm air flow. The largest ducts are the cold air returns, but these are short excepting for the one which connects into the downstairs hall.

One of the most important features of any piece of equipment put into a home today is its appearance. The appliance manufacturers have made buyers appearance conscious and many a piece of equipment is bought or rejected solely on its appearance. Appearance has been made a sales adjunct of all Mr. Schwartz's jobs. Just as soon as the job is completed all the ducts through the basement, whether return air or warm air are painted. Most of the jobs are painted a slate grey which has been found attractive but not conspicious, and also a very good color to use when dust is encountered. The sheen on the ducts in the photograph indicate the attractive appearance of the duct work.

There is one phase of this installation which has not been touched on. That is the matter of cost of operation. Mr. Jarrett is very much interested in his heating plant. While the old system was operating he kept cost records and this practice has been continued under the new plant. This record which is not complete, but which runs up to the early part of this year gives the following costs:

Oct.	10	$ 4.80
Nov.	9	13.80
Dec.	10	25.20
Jan.	9	34.80
Feb.	9	57.60
Mar.	11	59.40
Apr.	10	51.15
May	31	19.20
July	17	11.40
Aug.	1	4.80
Sept.	18	4.40

After the new equipment was operating these costs ran as follows:

Sept.	28	$ 5.40
Oct.	29	11.40
Nov.	29	20.40
Dec.	23	35.40
Jan.	27	29.40

But these figures require some further explanation. All the costs listed are for gas only, the ones with the old equipment do not include the cost of burning coal in the coal furnace. While the cost of coal was not, of course, nearly so high as the cost of gas it did add materially to the cost of heating. Not only has the cost been reduced, but a much more uniform and satisfactory heating has been installed. This is the owner's own statement. The only cost the new system has brought that the old did not have is the cost of the electricity for the fan. The owner's calculations are a cost of $0.75 a month.

The owner has been decidedly a booster for the system and has spoken so favorably of his equipment that he has interested several of his friends.

The exterior of the house. Such splendid old homes offer wonderful opportunities for the warm air heating man able to design and install systems which will heat large rooms and large interiors

CHIMNEYS—

Defective Ones Cause Millions of Dollars of Damage, Endless Trouble, and Are Responsible for Much of the Failure in Heating

SINCE warm air furnace men are getting active in having the Standard Furnace Code inserted into building ordinances of the respective cities in which they do business, and since the chimney plays such an important part in determining the success or failure of a heating system to function properly, why would it not be a good idea to carry the campaign just a step farther and include in that ordinance a standard specification for chimney construction?

Recognizing the imperative need for guidance in chimney construction, in order to reduce the enormous annual fire loss caused by faulty chimneys, Fire Marshal of the State of Illinois, John G. Gamber, compiled a booklet in which he discusses the chimney problem. He also included in this booklet a chimney ordinance for use in states, cities, towns, villages and rural districts. What Mr. Gamber had to say on the subject is given below:

Forward

The average annual loss due to defective chimneys in the United States is becoming millions of dollars greater each year. The same condition holds true in connection with fires from sparks on roofs; sparks that are formed, in the majority of cases, by the ignition of soot in the corners of square or rectangular shaped chimneys. In addition to the fire losses, thousands of lives have also been sacrificed. In 1926, the total loss of lives and property was so alarming that this department, following up its former investigations, made a further exhaustive investigation that covered the entire United States and Canada.

The results of the investigations have brought this fact to light: *Nothing effective has been done in the past decade or more that has improved the chimney condition in residences although fires from this cause have been on a steady increase and are classed as "strictly preventable."*

Excerpts from Bulletin No. 1230 of the United States Government:

"Of the mistakes commonly made in home building, none is more frequent than faulty design and construction of Chimneys.—No defect in the construction of the house detracts more from the comfort of the home and none is a greater menace to life and property than a poor chimney and fire-place. Bad chimney design is also the cause of much avoidable expense in heating the house.—The use of unsuitable materials: clay sewer pipe, hollow building blocks, or unprotected concrete should not be used. A leaky flue is the most frequent cause of heating troubles, high fuel bills and destructive fires. The most efficient chimney is one built perfectly straight with a round or nearly round flue and a smooth interior surface. A round flue is most desirable because it offers less resistance to the spirally ascending column of smoke and gases."

The ancient Natural Law of ascending smoke and gases, which states that gases ascend spirally regardless of whether the chimney is round, square or rectangular, has been quite universally accepted by leading heating engineers and other authorities. Square corners in chimneys are detrimental to perfect results, due to possible smoke and gas eddies causing so-called dead air pockets, down drafts and collection of soot. Modern industry has expended tens of thousands of dollars in retaining heating engineers to solve their heating and power problems. The result is that almost without exception, round stacks of sufficient height and area have been installed as being the most economical and efficient. Today it is generally recognized that a round tight flue with a smooth interior surface and a flue of sufficient height and area, properly constructed, is the most economical and efficient flue regardless of whether the same is used to pull the wheels of industry or to pull the heater of the Home. *Unfortunately in house construction the same progress has not been made in the matter of efficient stacks as has been made in industry.*

Industry, Carefully Guided by Heating Engineers, Leads the Way

The Heating Engineer of one of the largest furnace manufacturing companies in the country has expressed himself on this question as follows: "Concrete or cement block flues should be avoided because they are pourous and will leak air wherever exposed to the outdoor elements. Further, cement will not withstand the high flue gas temperature and will crack, much the same as cement sidewalks do under the heat of the sun. A cracked chimney wall is a means of air admittance into the flue and is a positive detriment to the heating plant—so much so that in many of the larger cities, building ordinances positively prohibit construction of cement block chimney flues."

Our investigation has disclosed the fact that there are large numbers of concrete block chimneys used over the country. Quoting from Mr. Ira H. Woolson, late Consulting Engineer to the National Board of Fire Underwriters: "Concrete chimneys cast in place shall be suitably reinforced vertically and horizontally. The walls shall not be less

than 3¾ inches thick and shall have flue lining."

United States Department of Agriculture Bulletin No. 1230 states: "Walls of concrete chimneys should be reinforced in both directions; otherwise cracking during the setting of the concrete or later, due to temperature changes or unequal settlement of the foundation is apt to occur. Concrete blocks are not recommended, but if they are used each block should be reinforced with steel running continuously around it and the blocks shall be not less than 4 inches thick."

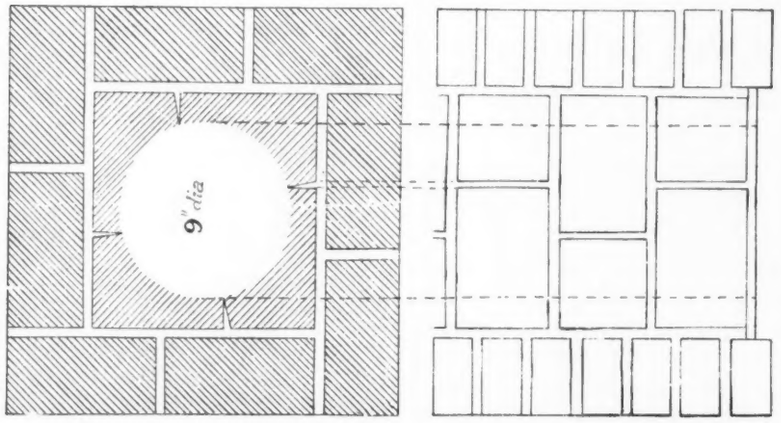


Fig. 1-C

It is quite obvious from the above that these authorities do not endorse the concrete chimney block as safe unless it is reinforced vertically and horizontally with steel.

In our investigation, this type of construction was found to be wholly inadequate. In general, the manufacture is carried on by persons not interested or equipped for making a good product. Secondly, it offers a medium to the unscrupulous builder to palm off on the American public a dangerous chimney under the guise of economy. This type of construction should be abandoned.

Flue Lining a Failure

Some years ago it was supposed that the addition of a flue lining to a chimney would solve the problem as it would reduce the number of vertical mortar joints. However, our investigation proves definitely that the flue lining has not done the work and afforded the protection that was expected of it. There are many reasons for this. The recommendation of the National Board of Fire Underwriters to the effect that chimneys with a four-inch brick wall be lined with a *fire clay* flue lining not less than three-quarters of an inch in thickness *has not in any sense been followed* for few plants making flue linings have deposits of fire clay, most of the linings being made of brittle shale.

There is no standard, it seems, on the quality of flue lining. And in the process of manufacture it is impossible to get the sizes and thickness of the linings uniform. There is no way by which the Building Commissioner, Building Inspector or Fire Chief can protect the home owners through a proper flue lining as recommended. The result is that common clay sewer pipe, as well as all grades of tile of every nature and description, are used in chimney construction. It has been impossible to enforce the recommended method of construction, and past ordinances covering such construction in general have not, therefore, and could not be enforced.

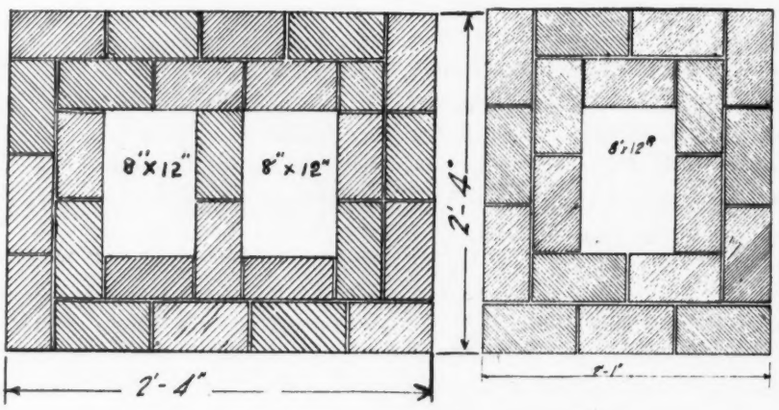


Fig. 2-A

Fig. 2

Flue Lining Not Easily Laid Up

The problem of properly laying up a chimney using flue lining has not only proven to be too much for the average mason, but it has also caused Building Inspectors an untold amount of grief in answering complaints from dissatisfied home owners.

D. Knickerbocker Boyd, Consulting Architect of the Eastern Clay Products Association, whose members are large distributors of the flue linings in America, writes of the proper method of constructing a flue-lined chimney and also tells of the improper methods being used today. In the April, 1926, issue of the quarterly of the National Fire Protection Association is Mr. Boyd's story taken from an article entitled, "Stopping Fires Due to Chimneys and Flues":

"In building a chimney, each section of lining should be carefully placed on the section below with a thoroughly mortared joint, surrounded by not more than two courses of brick work, slushed in to steady the lining. The brick work should then be built up around the lining, slushing in mortar between the brick and the lining, as each course is laid with full bed and vertical joints. Unfortunately, this method is not as quick or easy as building up the brick work and dropping the linings down. Consequently the latter method is most

frequently used, the joints are not tight and the lining is not properly set with a tight filling of mortar all around. The conditions are tolerated in spite of the perpetual fire menace as well as annoyance and added cost of heating."

and the smoke passages in the heating device be free from soot. *Accumulation of soot in any chimney introduces the risk of a chimney fire with the consequent danger of sparks being thrown upon the roof or penetrating cracks in the chimney*

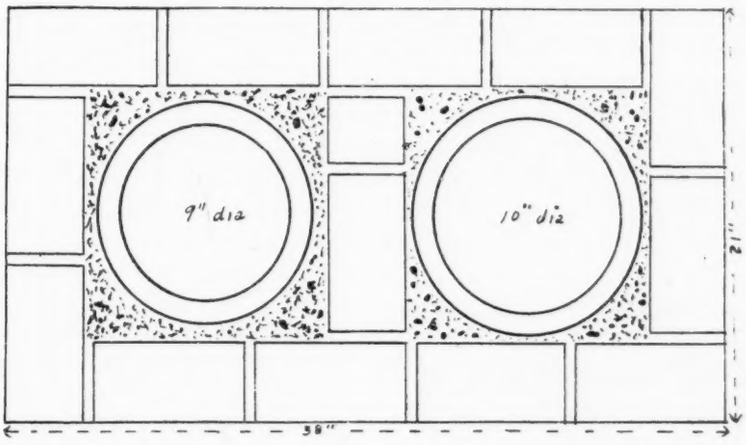


Fig. 3

Heating and Cooling Causes Breaking Down of Flue Lining

Due to the intricacies of house construction the mason *is oftentimes called upon to perform his duties in cramped and close quarters in such a manner that it is impossible for him to work entirely around the tile;* consequently, the only method left is to build up the brick work and drop the tile into the dark space below and trust to luck that the tiles will meet truly and make an air-tight joint, a thing which we must recognize as impossible. If the flue lining is placed in the chimney as noted by Mr. Boyd, there is still plenty of authority and evidence to the effect that with heating and cooling causing expansion and contraction, the flue lining will weaken, crack and break down, often causing stoppage of the flue. Naturally, this is an added fire hazard.

Mr. Ira H. Woolson, late consulting engineer of the National Board of Fire Underwriters, further covers the cracking of flue lining from another cause in his ordinance for construction of chimneys, 1921:

"For the efficient and safe operation of heating apparatus it is extremely important that both the flue

walls. This is a very great hazard and is the reason why chimneys should never be purposely burned out to clean them. The burning out of a tile lined flue is liable to crack the lining."

In view of the thousands of chimney fires taking place monthly, it is easy to derive the fact that flue linings do crack and break down and this, of course, gives us in all such cases an added fire hazard and one that cannot be passed unnoticed.

Narrow Joint Not Tight Leaving Fire Hazard

Inasmuch as flue lining cracks and inasmuch as the narrow ¾-inch horizontal mortar joint on a tile lining is seldom tight, and inasmuch as the vertical mortar joints of the four-inch brick wall are less likely to be properly struck when a tile lining is used, it is easy to draw the conclusion that from a construction standpoint the flue lining has not solved our problem and this fact we should face fearlessly.

In addition to the bad joints and cracking of tile through above-mentioned facts the evil practice of installation men in breaking an opening into a chimney through the tile lining with a crow bar or hammer or other heavy instrument, thereby mutilating or ruining one entire section of lining and oftentimes partially or wholly plugging the chimney, the way is paved for the accumulation of furnace gases and probably fatalities and fire due to explosion. Also the failure to mortar up all spaces between the tile lining and the brick work brings about the same disastrous result. *This bad practice is positively criminal and legislation should be enacted to prohibit it.*

Reduced Area Through Flue Linings

One other point is that we find the majority of flue linings square and rectangular and that the use of them in general brings about a smaller flue area, the example being that the average 8-inch by 8-inch flue carries in it a flue lining which brings the diameter down to about 7 inches and the 8-inch by 12-inch flue with a flue lining brings the small diameter down to about 7 inches. Chimneys of such sizes are often not of sufficient area to do the work and bring about forced firing with open draft, which does not help the situation. Again, the square and rectangular-shaped flue linings catch and hold soot in the corners which finally ignites, causing fires from sparks on roofs.

In the writer's lifetime he was affiliated for a number of years with the clay products industry where flue linings and brick were manufactured, and because of that experience, he knew where best to look for information in connection with the suitability of tile lining for the purpose for which they were intended. Complaints coming in regularly through fire chiefs, deputies, inspectors and others from our own State decided him upon making an investigation that would cover the entire United States and Canada. Naturally State Inspection Bureaus do not have the men necessary to make actual inspection of chimneys, and we find that it is very seldom that they have had opportunity to get into that work. Even building commissioners, whose offices are never given appropriation enough so

that they can make inspection of chimneys that have been up for some period of time, could not be expected to give a great deal of information and the large number of fires traceable to poor chimney construction in itself is the culmination of their report.

Most Reliable Authorities

Undoubtedly the most reliable and authentic reports have come to us from heating and ventilating engineers and from men and organizations who work on chimney construction. The men who make installation of boilers, furnaces, ranges, gas stoves, etc., are the men who run into chimney troubles, and their organizations are the ones who have had to suffer, together with the home owner, a combined useless expense of millions of dollars yearly. This is an economical waste that can be eliminated to a very great extent. Out of 250 reports carefully gone over from such authorities, we find that all of them claim trouble with defective chimneys. Nearly all of the reports stated that there was soot collection in the corners of rectangular-shaped chimneys and they were practically unanimous in the opinion that round flue chimneys are better than square flue chimneys but that there were very few of them in evidence. Amongst these reports were about 100 from manufacturers of boilers, furnaces, ranges and gas stoves, and of these the almost unanimous complaint was that the heaters failed to work because of defective flues either from leakage, stoppage, lack of area, or insufficient height.

In analyzing the condition further it was noted that 50 out of 67 who reported on this feature stated that the flue-lined chimney gave them more trouble than did the unlined chimney, the cause being leakage because of cracked or missing linings and separation of the linings at the joints.

Reports from 150 installation men are in general to the effect that flue linings cannot easily be built in properly and that if they are built in properly, they will still crack and break down, causing trouble. These reports have come from every part of the country, and an investigation following such reports proves them as having sufficient foundation to determine this office to seek the remedy. *The terrific loss of life and property through defective chimneys can be stopped through a proper chimney ordinance, and if building commissioners, fire marshals, contractors and builders will put into effect and specify the use of chimney materials in their construction and follow the suggested specifications and building practices following herewith, we are certain that they will materially reduce the great chimney fire hazard.*

Many communities are now agitating for a standard furnace code. The purpose of the code is to insure satisfactory installations. Furnace men should not forget, though, that a good tight chimney is also essential. So—when you are working for the code insist that a chimney ordinance be put on the law books at the same time.

This ordinance is being published only after very long and serious thought and discussions with authorities from different sections of the country, together with a study of European conditions where fire loss is small. The initial cost of the chimney types recommended in some cases may be a little higher but the insurance rate is less on all of the four types recommended than on types of concrete block chimneys which carry a higher rate. In the construction recommended, *the upkeep through saving of fuel alone should pay for any additional cost of the chimney in a comparatively short time, and forever in the future the spectre of the dread fire demon will be eliminated and also the loss of life and property, which loss cannot be estimated in dollars and cents.*

Adding 20% to Cost Does Not Mean 20% Profit

MANY sheet metal and furnace men figure that if they want to make 20 per cent profit on a sale they have only to add 20 per cent to the cost price to get that margin of profit.

Accountants and business experts, however, tell us that the process is not so simple. The National Supply and Machinery Distributors Association, Philadelphia, have given the matter considerable thought and consideration and speaking for business generally have figured out a table which shows the per cent of cost which must be added to effect a given percentage of profit on a sale.

The table is as follows:

Add % to Cost	To Make % Profit on Sales	Add % to Cost	To Make % Profit on Sales
1	0.99	26	20.63
2	1.96	27	21.26
3	2.91	28	21.88
4	3.85	29	22.48
5	4.76	30	23.08
6	5.66	31	23.66
7	6.54	32	24.24
8	7.41	33	24.81
9	8.27	33⅓	25.00
10	9.09	34	25.37
11	9.91	35	25.93
12	10.71	36	26.47
12½	11.11	37	27.01
13	11.50	37½	27.27
14	12.28	38	27.54
15	13.04	39	28.06
16	13.79	40	28.57
16⅔	14.29	41	29.08
17	14.53	42	29.58
18	15.25	43	30.07
19	15.97	44	30.56
20	16.67	45	31.03
21	17.36	46	31.51
22	18.03	47	31.97
23	18.70	48	32.43
24	19.35	49	32.88
25	20.00	50	33⅓

The percentage of profit should always be figured on the selling price and not the cost.

LET'S ALL CASH IN ON ADVERTISING

The Keynote of a Plea for More Attention to Advertising

By **THOMAS D'A. BROPHY**

A Speech Before the N. S. M. C. A. Convention

I had the pleasure a few weeks ago of listening to an able talk by your Secretary, Mr. Markle, at the meeting of the metal branch of the National Hardware Association, at Niagara Falls. The most vivid recollection I have of Mr. Markle's remarks was the statement he made that we must consider the sheet metal industry as a three-legged stool, made up of the sheet metal manufacturers, the sheet metal jobbers and the sheet metal contractors.

I think that is a very apt illustration, and I think perhaps it applies with greater force to the sheet metal industry than to most industries, because in truth the development and success of our industry is leagued very definitely in these three groups.

In times of prosperity we get along very nicely, even though the stool may be a little wobbly, and it is only in times like these when business is hard to get that it is absolutely essential, if we are to compete with other industries, for us to make the stool tight so that each leg will carry its own share of whatever weight is placed upon it.

I am not unduly pessimistic about the business situation, yet I do feel (and I am sure that most of you business men here feel the same way), that the holidays are over and that business for the next few years will be difficult to get. We are going to work hard for the business we get in the future, and we must bring into play new methods, new economies and get away from some of the haphazard methods we used when business came in a very easy manner.

What can we do as an industry to tighten up so we will be able to meet the competition we are facing today in the matter of competition with other industries?

There is no question but that in the last few years there has been a complete change in the type of competition American business men must face. It used to be we thought of competition as between ourselves, as between sheet metal contractors, and as between sheet metal manufacturers. We have found in the last few years that a new competition has developed, a competition between industries.

The automobile industry, the radio industry, the electric refrigerator industry—all of these other industries are bidding for the consumer's dollar.

The consumer's dollar has always been limited, but it is more limited today than ever before, and it is going to be limited for a number of years to come.

Gentlemen, if the sheet metal branch of the building industry is to progress and forge ahead, it will be necessary to take cognizance of this new competition and take whatever steps necessary to make sure that we get as much of the consumer's dollar as we are entitled to.

There is no doubt in my mind but that there is a great field for the expansion of business in sheet metal.

The other competition we must face is the competition that exists against the building industry. You all know that today many a man is not building his own home, or purchasing a home because he would rather own an automobile. This competition between industries has no limitations. It is all directed toward that part of the consumer's dollar available and each one of these industries is endeavoring to get as much of it as it can.

We in the building industry are not as well organized as some other industries. In the first place we do not have the long profit that certain other specialities bring. We do not have the long profit in our business that is found in the automobile industry, the electric refrigerator industry, and the radio industry. Consequently we can not, as individual concerns, make the necessary expenditure of money for advertising. I would that we had a larger margin of profit but it can't be done. Therefore, we must take what steps are necessary to combat that competition with the tools and equipment we have at hand.

For a period of ten years I have been concerned in promoting the uses of copper and brass in industry, and I have been amazed to find during that period how disinterested the sheet metal industry as a group are in the efforts being put forth by the manufacturers to help them. Progressive manufacturers of sheet metal spend hundreds of thousands of dollars each year in the matter of advertising their material in the trade papers, the Saturday Evening Post, Colliers, and other national publications. Why?

For the purpose of bringing more business to you sheet metal contractors.

The manufacturers supply free of charge many dealer helps in the manner of expensive literature, and I know for a fact that much of that material has not been appreciated by some of the sheet metal contractors. I wouldn't say it has not been appreciated by all, but it has not been appreciated by some, and I want to believe that the reason is not that sheet metal men do not appreciate the value of advertising, but because business was so good he didn't feel that he needed that help.

Business is not so good now. The manufacturers are spending hundreds of thousands of dollars a year in their advertising programs in an effort to interest the public in the use of quality sheet metals. I believe the time has come and gone when the sheet metal contractors of the country should take a more aggressive and more active part in co-operating with the manufacturers in this effort to make the public desire better sheet metals.

Our large manufacturers may spend $8,000 for one page in the Saturday Evening Post. That page is broadcast to over three millions of people. It is not intended that that page of advertising or any number of pages of advertising placed in these publications will actually induce people to come into your shops, but it is intended that this type of advertising will make them receptive to your selling efforts.

To supplement this advertising, the manufacturers furnish the sheet metal contractors with signs, printed literature, displays, etc., which tie in with the national advertising, thereby influencing those people who are in the market for that particular material. Therefore, it is necessary for the local sheet metal contractor to keep following up that lead, not spasmodically, not occasionally, but as a regular business procedure. If he does that, when the individual happens to be in a receptive mood he will listen to your sales talk on the use of sheet metal. When he sees the national advertising in the magazines he will think of you and come to you where you will be able to do the real and active selling.

Advertising alone rarely sells. Only in such cases, for instance, in the advertising of cigarettes or gum does advertising sell.

We used to think competition was between ourselves. That is no longer true. Today the consumer is being aggressively besieged by manufacturers of automobiles, radios, appliances, etc.

We have got to get our message to the consumer before the other fellow does or say it more emphatically. If we don't the public is just *not* going to buy heat. It would rather have the other things.

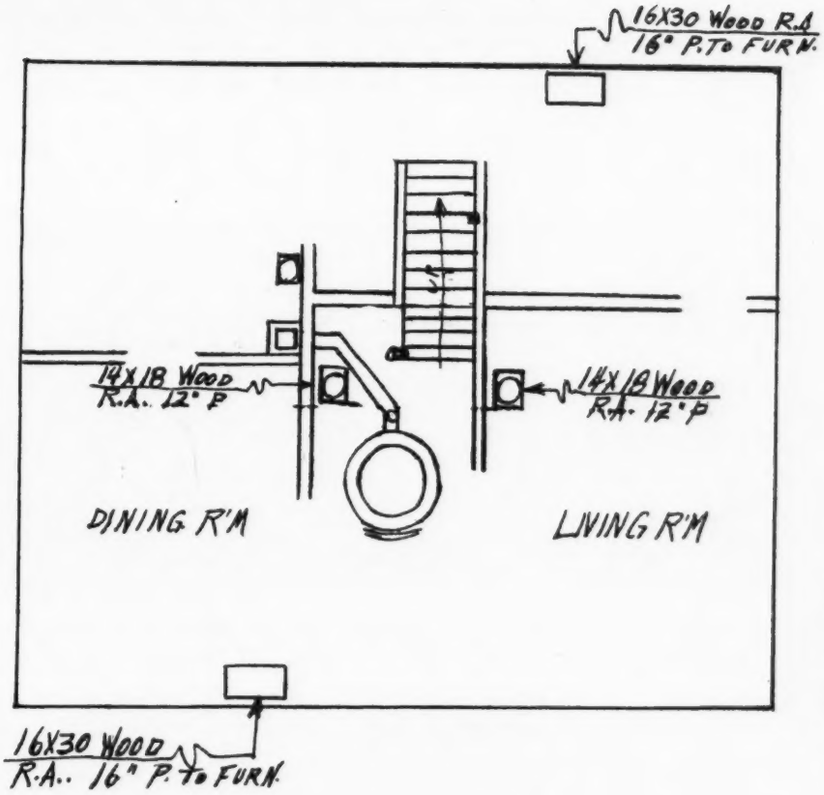
Advertising merely plows the ground, making it easy for the local man to sell, and it is up to the sheet metal contractors to take advantage of this type of advertising the manufacturers are doing for them.

Gentlemen, none of us can afford to waste money, therefore if this money is not to be wasted in advertising it is absolutely essential that the proper degree of co-operation be established and maintained on the part of the sheet metal contractors. And to repeat, I mean by that not occasionally and spasmodically, but put forth as a concerted effort to follow through and tie in with the advertising and promotional work that is being done by the manufacturers for the purpose of stimulating business.

Some of you may say it is a fine theory but is too expensive. You may say you haven't the time and money to put into that co-operation and the results are too intangible. You may not be able to see an immediate profit.

But let me say it merely requires a little thought on the part of the sheet metal contractor to properly equip himself in order to co-operate in this respect. It isn't necessary in most instances to add to your present duties or take on new help, it merely takes some thought and planning, assigning to somebody in the organization some definite work along this line. Perhaps the bookkeeper or stenographer or salesman shall be designated to make use of these sales helps furnished by the manufacturers and see that they are properly used. If that is done, I believe it will result in a larger volume of business for the sheet metal contractor. I won't say it will result in an increased volume of business next week or next month, but if this is done consistently and in co-operaion with the manufacturers in their advertising campaigns in national publications, it can't help but sell merchandise and will go a long way in overcoming and combating the competition we are facing today.

All manufacturers today are in much the same position. We are in a position of over-production. We have facilities greater than the demand for the products we manufacture. Therefore, there is a great urge on our part to find new business. We are all anxious for new business and we are all working hard for it. If we are to get that new business, we hope to get it through your co-operation, assistance and help, and we hope to get it in a manner that will be profitable to you as well as to us.



This shows the remedy to the floor draft as worked out by N. R. Turner. It is quite different from the sketch we worked out from Mr. Turner's first reply. You can check the changes by referring to the May 24 issue

That Floor Draft Problem Is Still Clicking Along

IN the May 24 issue we showed a layout for correcting the floor draft problem as suggested in a letter from N. R. Turner of Toronto, Ontario. We drew the sketch from the letter but did not follow Mr. Turner's suggestions.

Accompanying this short article is the layout as Mr. Turner intended it to appear.

He writes us as follows: The plan shown in the May 24 issue is not the plan which I had in mind. Herewith is my plan.

For reasons which were given in my previous letter no attempt was made to analyze the general plan even though its transgressions of some of the rules of good practice are obvious.

And in the same mail with Mr. Turner's letter comes this interesting one from C. F. Malone of Davenport, Iowa, International Heater man.

His letter fellows:

AMERICAN ARTISAN
Chicago, Ills.
Gentlemen:

I have been reading the different discussions, and looking over the different drawings referring to the drafty floor problem, which has been running in your columns for some time, I thought I would hold aloof from it all, as I very seldom appear in print, but it seems to me, that from all angles this is a very poorly balanced job from the standpoint of efficiency, yet the only one that has struck the keynote in any degree is my good friend, G. A. Voorhees.

It has been my policy for many years (and the results speak for themselves), to figure out the load on each return air duct, and to locate that duct where it could and would gather up the air with the least amount of draft, and always locate them in the direct path of the flowing air, so in the case of this house, everything being figured correctly from the standpoint of the Standard Code, and the cold airs located as all have been, the floors would still be drafty.

Combination heating gives the best results that can be obtained in warm air heating, but the sizes have to be figured and installed correctly. We have done this for over 25 years, the most of this time for one concern, have figured for Heating Contractors, and have been able to hold this trade for many years, and have always used the combination method, that is to say, heated first

(Continued on page 42)

GRAVITY EXHAUST VENTILATION

Monitor Sash Versus Ventilators

By **PAUL R. JORDAN**
The Paul R. Jordan Company

IN the June 7 issue we presented a problem sent in by one of our readers on the subject of handling ventilating in industrial buildings having monitor type roofs, either for light or for ventilation.

This reader operates in a community where there are several large industrial plants and also many smaller ones. He feels that there is a field for the ventilating man who is willing to go out and sell these companies on the value and desirability of having their plants and operations adequately ventilated.

He put the proposition to us like this:

1. What is the best way to handle heat removal?

2. How about monitor construction? Is this a good way to handle heat removal? If it is, where does the sheet metal contractor get off? If, on the other hand, ventilators are better, why are they better? What can the sheet metal man say to prove it?

3. How about sawtooth construction?

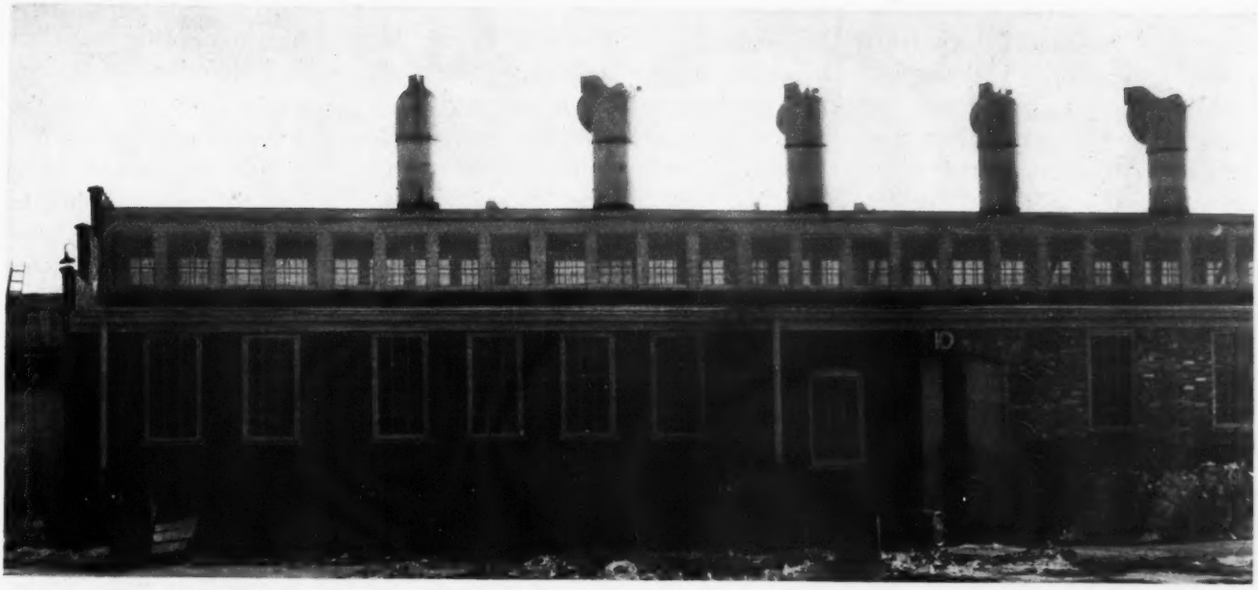
4. If there is something to be said in favor of ventilators, how can the contractor who wants to see this work retained in the sheet metal field go about it to see that it is kept there? What can he say about new construction and who can he say it to? Is there any use of his wasting any time on a prospect where they have an old building already equipped with operating sash?

The result of this request was that we sent the query to Paul R. Jordan of Indianapolis and asked him to give us the result of any experiences he has had along this line. His reply follows:

Your question on heat removal is quite seasonable as this problem is very acute at this time of year and the sheet metal contractor is usually called in to solve the problem. If he isn't, he ought to be.

The best way to handle heat removal is by withdrawing the heated air or gases from the point where they naturally accumulate and by introducing at the same time cool, fresh air at the floor line. The hot air naturally rises and can usually be pocketed at the ceiling where it must be withdrawn before it circulates back down and also before it radiates its heat back to the floor again to any great degree. Mixing of the heated air with cooler air is only 50 per cent effective. The so-called dilution method therefore is

The Noblitt-Sparks plant solved their ventilation problem by nailing shut the windows of the monitor. The 36-inch ventilators exhaust all the fumes and gases. The installation has proved 100 per cent efficient



On this new building the sash were permanently closed when the building was built. The ventilators take out all the fumes and gases and exhaust uniformly through the interior. Monitor sash could not do this

not good as applied to heat removal, in fact it is not good as applied to anything where segregation of the objectionable element is possible, or where an introduction of cool or pure air can be effected at the point where it is needed.

Cool air naturally hangs at the floor line. As fast as it is heated it rises; therefore withdrawing air at the top and introducing it at the bottom gives a perfect heat removal layout.

The above refers only to heat removal, not to heat elimination or baffling. It is often wise for the person who is called in, be he contractor or engineer, to include in his survey an investigation of the source of the production of heat and of the possibilities of curtailing this introduction of heat, or at least of nullifying its effect to some extent. Baffling, screening and insulating come in here.

The best way to remove the heated air is with gravity ventilators. Under ordinary circumstances, fans can be used, but are inferior in point of economy of installation and first cost, and also in point of upkeep. The matter of upkeep is often quite an element as in addition to the cost of current, the heat will cause the motors to burn out so that the armatures have to be frequently rewound at considerable expense.

Regarding monitor construction. According to my experience monitor construction is not good for anything excepting lighting. If it is used for ventilation then the sash must be movable, and movable sash overhead are not practical. Even if the movable sash operate perfectly and are watertight and airtight (which they are not) they give only fair results in ventilation, and then only when some person with sufficient intelligence and with not too much on his mind, sees to it that they are always closed to the windward and open to the leeward. My own conclusions with regard to monitor construction have been substantiated within the past month by two plant managers, Clifford Noblitt, plant manager of the Noblitt-Sparks plant at Columbus, Indiana, and Edwin T. Nipher, plant manager of the Ames Shovel & Tool Company plant at Anderson, Indiana. Mr. Nipher, who is a graduate engineer and who contacts with engineers, made the statement as conforming not only to his own experience, but as his understanding of the experience of engineers in general, that "operated overhead sash is only fairly satisfactory for ventilation, and then only when intelligently operated at all times so as to keep them closed against the wind and open away from the wind."

Mr. Noblitt, who has been instrumental in the development of the wonderful plant at Columbus, from its inception up to the present time, states that "it is the definite policy of the Noblitt-Sparks Industries, Inc., to ventilate with ventilators and to use overhead sash only for lighting." Inasmuch as the original Noblitt - Sparks buildings were equipped with operating sash, it may be worthwhile to know just what is back of this policy.

The Columbus plant manufactures Arvin automobile heaters, also Ford, Chevrolet and Buick parts. In the manufacture of Arvin heaters they do a great deal of high grade plating work which releases fumes and moisture into the air. Some of these fumes are vicious, and the moisture, while not vicious, is annoying, and furthermore will rot out the building, particularly the roof construction. Their ventilation therefore must be of the type which will not only take care of heat removal in the summer, but will also handle the removal of fumes and vapor in the winter. Mr. Noblitt tells me that their experience with operating sash is that they

are neither airtight nor watertight. They have had stock losses from rain leakage; also in cool weather cold air flowing in around the cracks has chilled the vapors and fumes and driven them back down into the working area. Another annoyance has been the breakage of glass in the operated sash, adding not only expense, but danger to the situation. Therefore Noblitt-Sparks have adopted a definite policy of using overhead sash for lighting, but of ventilating with ventilators. Conforming to this policy, Mr. Noblitt has ordered every movable overhead sash to be bolted or nailed tight and to not be opened under any consideration. He has adopted the 36-inch Aeroplane Rotary ventilator as a standard and has them installed on his monitor roofs in sufficient quantity to give them adequate ventilation. On the old buildings the sash have been bolted shut and holes cut in the roof and ventilators installed. As new buildings have been built they have been designed for fixed sash and certain ventilators have been installed as the need for them has arisen.

The two photographs shown are of the Noblitt-Sparks plant, buildings number two and three (showing ten Aeroplane Rotary ventilators, all of the 36-inch size), are old buildings in which the sash were originally of the operated type. The other photograph shows part of building Number Ten with five 36-inch Aeroplane Rotary ventilators in plain view with the tops of two more barely discernible. This is a new building and at the time this photograph was taken was not quite completed. In it the overhead sash were fixed. The ventilators on building Number Ten open directly into the room below, although some of the ventilators at other parts of the plant are connected to hoods. The policy of the Noblitt-Sparks Company is to handle each ventilating problem as a separate problem and to take care of ventilation on the spot where it is needed rather than to try to ventilate the entire room in such a way as to handle any or all of the various ventilation requirements in the room. This policy of segregating the ventilation problems works out well both as to economy and as to satisfactory solution of each ventilating problem. Mr. Nipher of the Ames plant has adopted a similar policy.

The Noblitt-Sparks plant is one of four plants located in different cities, but they all have the same policy as regards ventilation. This policy was first inaugurated by their president, Mr. Q. G. Noblitt, based on experience at their Greenwood plant.

I believe this gives the sheet metal contractor a good argument in favor of ventilators and incidentally in favor of handling ventilation as a sheet metal proposition and not as a carpenter proposition. It is true that many plants have neither the money nor the desire to ventilate properly. But there are nevertheless many plants that are interested in proper ventilation and are willing to pay for it. At the Noblitt-Sparks Columbus plant, where I have known them to turn out Arvin heaters at the rate of eight thousand a day, the need for ventilation is more acute than in a plant where production is not so high, but in any plant, large or small, up-to-date management will recognize the value of good working conditions for the employees. Light, heat and ventilation are three very important factors in working conditions and an intelligent consideration of each of these three factors points definitely toward the use of fixed overhead sash in conjunction with ventilators and with flues or hoods where necessary, and away from the operation of the sash in the monitor, sawtooth or skylight.

DRAFT PROBLEM

(Continued from page 39)

and second floor with one pipe from the furnace. We have never had a single case that was not satisfactory, so we say the principle is sound, BUT, good judgment must be used, as is true with every warm air heating installation.

Of one thing I am sure, that the pipe sizes are too small to heat this house, and I should, if I were doing it, figure out the sizes according to the code. I would install one large register in the hall, I would combine the pipe area of the second floor and hall and the first thing I would do would be to find a location in direct path of the cold air from the second floor, and there I would install a cold air register at least 10 per cent larger than the combined area of the total second floor and hall, then I would draw my cold air pipe in from the library, and locate it in the living room, and either throw the dining room cold air over to the double window, or drop it in the floor close to the furnace and a dollar to a dime there will be no drafts on the floor.

We are not acquainted with the conditions, but it seems to us that the furnace sets too far toward the front of the house for the best locations of the warm and cold air, but possibly this could not be helped. If we had a plan we could tell more about it. In many cases, we have gotten the owner to change the steps so that the landing could be either to the right or the left, this would enable one to set the heater back about three feet, which would help materially.

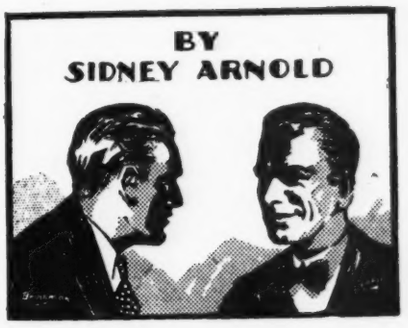
In conclusion, I will again repeat, that the location of the cold air is of vastly more importance than is generally given credence, as most everyone wants to shove them back in a corner, when good judgment should show that it will circulate better if it is out in the open. We always try and get them in a position from which the air can flow into them from several angles, the more the better, and our results have been very good.

Thanking you for this opportunity, I am.

Yours truly,

C. F. MALONE.

RANDOM NOTES AND SKETCHES



Four Out of Five Have 'Em

The crack salesman for a check protector system had been presented with a new set of twins—one lower and one upper row of never-been-used false teeth. He entered the office of the president of a small town bank. The president sat at the desk with hand over his mouth. "You'll have to 'xcuse me," he mumbled, "I've just had all my teeth pulled and I can't talk to you."

"Well, pardner," came back the breezy salesman as he removed his own teeth and slapped them on the table, "I don't want to take any advantage of you. Lesh start even."

* * *

The warm air heating and sheet metal business can't be as bad as pictured. I know this because last week I had a visitor from Anaconda, Montana. D. L. Longtin is the gentleman and he dropped up for a visit while he was attending the Rotary Convention here in Chicago. The week before that he was in Toronto, Canada, at the Shriner's Convention. If that doesn't indicate some prosperity I'm all wet.

Anaconda seems a long way from my desk. Even on the U. S. map here in the office, it's a long walk from Chicago. Yet by train it's only a few hours.

I don't know how many of you fellows have ever been out in that country, but I never have. As the name might indicate, the town is a copper mining and smelting center, with the entire 18,000 population engaged in some branch of the copper business or catering to it.

I've always heard that a copper smelter was a bad thing to live next to, but Mr. Longtin says there isn't a healthier place in the country. Science has progressed so far that many of the old troubles have been eliminated. Funny thing about a town like Anaconda. A person would think that all the buildings would use copper for the metal work, but Mr. Longtin says they use plenty of galvanized iron. Someone ought to tell the copper folks about that.

The most interesting thing about the visit was Mr. Longtin's comment on AMERICAN ARTISAN. He says that artisans operating so far from the big cities and the centers of heating and sheet metal work, do not have much opportunity to see what is going on in the world, except as they read about it in AMERICAN ARTISAN. He says we are doing a good job and we are glad to hear that. If we can just get the doings of the heating and sheet metal world to all you fellows we can feel that we are doing a good job.

* * *

Budgyet

Mrs. Goldberg and Mrs. Silverstein were gossiping over the back fence.

"I heard it today dot Abie Kazinsky vos keeping a budget."

"Vot!—und his vife too?"

Tch! Tch!

A church bulletin announced: "The women of this church have cast off clothing of all kinds. Look them over in the church basement any time this week.

* * *

The last issue of the magazine had hardly gotten into the mails before we had a telephone call from Roy Harrison, Illinois representative for Rudy Furnace Company, demanding that he receive the pure, 14 carat, gold banded ceegar for guessing the name of the smiling young man whose picture we published on the Random page.

And his guess was correct in every detail.

I suppose we ought to tell who the young man is. But we are not going to let the secret out this issue. You can take another two weeks to think it over. Yes, we have some other guesses. Some of them are about as far wrong as they could be. One fellow, whose name we won't mention for fear it might embarass him, said he was sure the picture was that of the son of Will Rogers. Now anyone who would make a guess like that ought to lose a contract.

* * *

Reward

A wealthy tourist lost his pedigreed dog while stopping in a small town. He inserted a lost advertisement in the newspapers, offering a reward of $100.

The next day he went to the office to inquire, but no one was to be found except a janitor.

"Where the thunder is the newspaper force?" asked the tourist impatiently.

"They're all out," the janitor replied, "trying to find yer dog."

Address of Magnolia Petroleum Company

From G. Owston, 20 West Fifth Street, Hutchinson, Kansas.

Can you tell me where the Magnolia Petroleum Company is located?

Ans.—Galveston, Texas.

Metal Garages

From Sheets Hardware Company, 127 South Main Street, Columbia City, Indiana.

Please inform us who makes metal garages.

Ans. — Martin Steel Products Company, Mansfield, Ohio; Thomas and Armstrong Company, London, Ohio; Trachte Brothers Company, Madison, Wisconsin, and Western Steel Products Company, Duluth, Minnesota.

"Danzer" Skylight Lifting Device

From J. A. Dart and Sons, 525 Quay Street, Port Huron, Michigan.

Can you tell us who makes the skylight lifting device called "Danzer"?

Ans. — Danzer Metal Works, Hagerstown, Maryland.

Sheet Lead

From George R. Baker, 414 Second Avenue, Alpena, Michigan.

Please advice me who makes sheet lead 2½ lbs. to sq. ft.?

Ans.—National Lead Company, 900 West 18th Street, Chicago, Illinois.

Grommets

From Radio Units Company, P. O. Box 84, Salt Lake City, Utah.

Can you advise us who makes soft rubber bushings called grommets for insulation of wires from metal panels.

Ans.—B. F. Goodrich Company, Akron, Ohio, and Rhopac Products Corporation, 927 Wrightwood Avenue, Chicago.

"Gem Circle" Gutter Hangers

From George R. Baker, 414 North Second Avenue, Alpena, Michigan.

I am in the market for Gem Circle Gutter Hangers ½ round 4 and 6 in. for single lead gutters. Can you tell me who makes them?

Ans.—Berger Brothers Company, 237 Arch Street, Philadelphia, Pa. *Chicago office:* 140 South Dearborn Street.

Anemometers; Chimney Draft Gauges

From H. Caldwell, 869 Dayton Avenue, St. Paul, Minnesota.

Can you tell me who makes an anemometer; also chimney draft gauges?

Ans.—1. E. Vernon Hill Company, 64 West Randolph Street, Chicago, Illinois. 2. Ellison Draft Gauge Company, 214 West Kinzie Street, Chicago, Illinois; The Hays Corporation, Michigan City, Indiana, and E. Vernon Hill Company.

Grates for "Goder" Incinerator

From Weber the Roofer, 4324 Cottage Grove Avenue, Chicago.

Who makes the "Goder" incinerator? I want a set of grates for it.

Ans.—This was made by the Goder Incinerator Company of Chicago, now out of existence. However, Joseph Goder, 612 North Michigan Avenue, Chicago, can furnish the grates.

Repairs for No. 340 A. D. Northern Furnace

From The Werner Company, Tracy, Minnesota.

Please give us the address of the company making the No. 340 A. D. Northern Furnace. We require repairs for it.

Ans.—The Forest City-Walworth Run Foundries Company, 2500 West 27th Street, Cleveland, Ohio, made this for the Northwestern Furnace and Supply Company of Minneapolis. The Forest City people can furnish the repair parts.

"Silentair" Fan and Washer

From Carr Supply Company, 414 North Dearborn Street, Chicago.

Who makes the "Silentair" fan and Washer, mentioned on page 31 of the May 24th issue?

Ans.—A. Gehri and Company, Tacoma, Washington.

Furnace Vacuum Cleaners

From Fred Carlson, 1041 Minnesota Street, Hancock, Michigan.

Who makes a furnace cleaner?

Ans. — Brillion Furnace Company, Brillion, Wisconsin; The Kent Company, Inc., 103 Canal Street, Rome, New York; National Super Service Company, 1944 North 13th Street, Toledo, Ohio, Williamson Heater Company, Cincinnati, Ohio, B. F. Sturtevant Company, Hyde Park, Boston, Mass., and Invincible Vacuum Cleaner Mfg. Co., Dover, Ohio.

Course in Sheet Metal Pattern Drafting

From E. Plasur, Box 419, Hynes, California.

Will you please advise where I can take a short course in sheet metal pattern drafting?

Ans.—St. Louis Technical Institute, 4543 Clayton Avenue, St. Louis, Missouri.

Information on How to Make Shaving and Dust Collecting Systems

From Pinkus Company, 347 North 2nd Street, Philadelphia, Pennsylvania.

Can you tell us how to make a shaving and dust collecting system?

Ans.—This subject is treated very well in "Standard Practice in Sheet Metal Work," the book which was compiled by the National Sheet Metal Contractors' Association and sold by AMERICAN ARTISAN. A section devoted exclusively to shaving and dust collecting systems contains 85 pages—45 pages of layouts and diagrams showing typical installations and 40 pages of text.

Who Makes "Chautauqua" Oil Heater?

From Roanoke Hardware Company, Roanoke, Illinois.

Can you tell us who makes the "Chautauqua" oil heater? We require wicks for it.

Readers: Do any of you know who can supply these wicks?

ASSOCIATION ACTIVITIES

Northwest Furnace Dealers Offer Prize for New Slogan

A slogan to be used in advertising the merits of northwest-made heating and ventilating systems is sought by Northwest Furnace Builders. The organization will offer a prize for such a slogan in a contest which will be started immediately following the next meeting of the warm air furnace manufacturers of Washington and Oregon—to be in Silverton, Ore., Friday, June 20.

Members of the organization agreed at their last meeting in Chehalis, Wash., to use the slogan adopted in all their advertising material. L. C. Eastman, of Eastman Bros., Silverton, Ore., has stated that the winning slogan must stress the advantages of warm air systems of heating and ventilating and the advantages of buying northwest products as well.

Mr. Eastman is chairman of the special committee appointed by the organization president, Ralph T. Montag of Montag Stove Works, Portland, to submit final plans for the slogan contest. Announcement of prizes and details of the contest will be made after the meeting.

A budget sufficient to cover the cost of advertising the contest and prizes will be raised by the Washington and Oregon warm air men at the Silverton meeting. Eastman Bros. of Silverton will be host at the session. The afternoon business meeting will be preceded by a golf match and followed by a dinner.

Chamber of Commerce at Olympia, Wash., has invited the furnace manufacturers to have their next meeting at that city.

T. H. Maddox of Tuttle and Bailey Tells LaFayette District How to Sell Registers

At the district meeting held in LaFayette, Indiana, June 20, a very interesting speech was delivered by T. H. Maddox of the Tuttle and Bailey Manufacturing Company.

Mr. Maddox said:

A large percentage of furnace dealers regard registers as a necessary, but very minor part, of warm air heating plants. Luckily there are a few who have grasped the idea of register replacements and have been rewarded with gratifying results.

All of you in making furnace replacements have noticed registers that are badly marred or fail to close properly; but how many of you stop to make a thorough examination and then try to sell all new registers? We will wager that a very few have done it, but the showing that a few of the installers have made has given us the incentive to put some time and thought on this idea. The result is our modernization and replacement campaign. This campaign is an advertising scheme which takes in the following:

1. Color in registers
2. Circulation cures
3. Automatic control
4. Repairing and cleaning pipes, etc.

We suggest a month's intensive drive. First by preparing a list of good prospects. (Namely the home owners having warm air heat) and mail circulars about one week apart (Tuesday and Thursday) also insert ads as shown in circulars in newspapers (best days are Sundays and Wednesdays).

2. Then at least once during this month, get each prospect on the phone and give them a brief, snappy talk with interesting mention of each of the four specialties.

3. Arrange a special display of registers in different finishes, etc., in windows. Also have circulars and copies of your ads posted on your windows, which will attract attention.

4. Lastly, don't forget the follow-up. This is perhaps the most important of all because when you have aroused interest and your prospect is in a mood to talk business you want to sell him. A good method of following up the campaign is with conservative but frequent publicity. All advertisers know "Continuity pays."

We might stop here to mention a few of the ills you find in registers and what they can and will lead up to. The two most common are, of course, the finish being worn and chipped or the pivots being worn and the registers fails to close properly. Or you might find ill fitting boxes will cause the walls to become streaky or registers too small for the capacity needed.

Another good talking point today is registers to harmonize with the decorative scheme in the home.

We are all aware of the lowered building rate and since people are so reluctant to build, why not jump onto the accessories and put them across. This is just the opportunity you have been waiting for to boost your business and realize a nice profit. Now since the manufacturers and jobbers are willing to supply the circulars at their own expense, I believe the dealers should be more than willing to co-operate with us and put this thing across.

NEW ITEMS *and* NEWS ITEMS
From and about the Manufacturers and Jobbers

Merritt L. Wolfe of Berger Brothers Co., Passes Away

AMERICAN ARTISAN learns with regret of the passing of Merritt Wolfe who died June 13th. Mr. Wolfe was only 43 years old.

Mr. Wolfe was known in the sheet metal industry from one end of the country to the other. He was known for his untiring energy in behalf of progressive things and for his ability to make and hold lasting friends.

AMERICAN ARTISAN extends its sympathies to his associates and relatives.

J. R. Lumm, Baltimore Copper Mills Man, Is Transferred

John R. Lumm, who represented the Baltimore Copper Mills in Ohio, Michigan and Indiana, was recently transferred to the Michi-

gan Copper & Brass Company of Detroit, Michigan. Both companies are divisions of the Revere Copper & Brass Corp.

The transfer was made due to allocating the sales organizations according to zones and the Michigan Copper & Brass Company now has supervision of the territory that Mr. Lumm serves.

Mr. Lumm still retains his residence in Toledo.

Sheet Metal Contractors Visit Follansbee Brothers Company Mill

On June 13th, about sixty-five

sheet metal contractors and their wives attending the sheet metal convention were driven to the Follansbee Mills at Follansbee, W. Va.

The party was escorted in small groups by Follansbee metallurgists and engineers who explained all the interesting processes in detail to the visitors. The Follansbee process of forging created much interest and a good deal of time was spent watching the ingots, heated to a red heat, being squeezed and worked under the great press. Many sheet metal contractors realized for the first time the prime importance of forging in the production of fine tin roofing and tin plate.

Rolling the sheets and coating them was also interesting to the visitors. FOLLANSBEE FORGE Best Roofing Long Sheets were under production, which process had never been seen before by any of the visitors.

After leaving the mill, the entire party was driven back to Pittsburgh and were tendered a dinner by Follansbee Brothers Company in the English Room of the Fort Pitt Hotel. It was a most enjoyable party.

American Rolling Mill Co. Issues Armco Architectural Bulletin No. 1

The Armco Architectural Bulletin No. 1 has been issued by the American Rolling Mill Company of Middletown, Ohio.

This bulletin features a new and unusual use for sheet metal—porcelain enameled metal blackboards for school rooms. The soft velvety looking porcelain enameled blackboards come in green, brown, blue or any other color or shade of color the architect desires.

How the blackboards are made and installed is another feature of this pamphlet.

This bulletin is available to any reader who wishes to write the company for it.

HYRO UNXLD DAMPER QUADRANT

THE damper regulator is just as important on a heating or ventilating job as the throttle on an automobile. If it works loose, doesn't show the position of the damper from the outside—in short, if it doesn't control the passage of air accurately—it is a reflection upon your skill and a handicap to your profits.

Avoid damper kicks by installing Hyro UNXLD Damper Quadrants on every job. Architects, heating and ventilating engineers, contractors—all who have anything to do with dampers—agree that the Hyro UNXLD is the best damper trouble insurance.

Hyro UNXLD Damper Quadrants are built *right*. The malleable iron handle can be locked in any position on the indicating scale by a twist of a wing nut. The carefully made frame, designed for a maximum of strength and a minimum of weight, is installed with equal ease on both flat and curved surfaces.

UNXLD comes in five sizes to take care of the smallest as well as the biggest jobs. For further details and prices send in the coupon below.

HYRO ALSO MAKES A COMPLETE LINE OF OTHER DAMPER ACCESSORIES AND No. OX METAL PUNCH

A small, strong punch for 14 gauge sheet metal and lighter. Measures 8" over all and weighs 2⅝ lbs. The most powerful punch of its size.

This is the *different* solder iron handle. It *screws* on, cutting its own thread on the stem of the solder iron.

SHUR-

GRIP

SOLDER IRON HANDLE

Can't split or come off. Has an air vent that prevents heating and scorching.

HYRO MFG. CO., Inc.
202 VARICK STREET
New York City

Mail this coupon today for prices and full information

Hyro Manufacturing Company, Inc. 7-30
202 Varick Street, New York City.
Please send me prices and details about (Please check)

Damper Accessories ☐
Metal Punches ☐
Shur-Grip Handles ☐
All Products ☐

Name.....
City.....
Address.....
State.....

Milwaukee Corrugating Co. and Eller Mfg. Co. Change Their Names

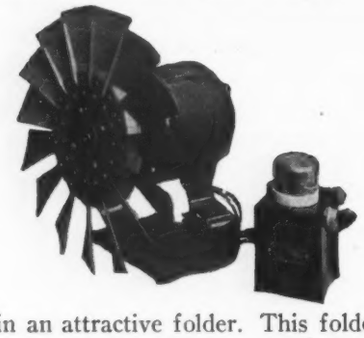
Effective July 1st, 1930, the Milwaukee Corrugating Company of Milwaukee, Wisconsin, and the Eller Manufacturing Company of Canton, Ohio, will be known as the Milcor Steel Company.

Both companies have been well and favorable known to the trade for nearly half a century. Ownership, management and personnel will remain the same.

Peerless Furnace Fan Now Made in Three Sizes

The Peerless Electric Company of Warren, Ohio, makers of Peerless Furnace fans are now making their fans in three sizes, two types and two models. These include a multi-blade and the six bladed senior model a junior model in either multi or six blades and a register fan.

The complete line together with descriptions and capacities are given



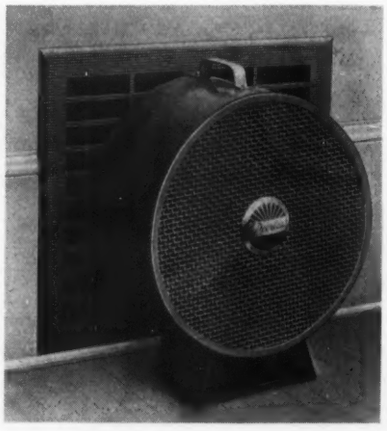
in an attractive folder. This folder also gives suggested installation methods and shows diagrams and photographs of typical installations.

Some brief details of these fans are: The senior multi-blade is a 14-inch fan enclosed in a special housing. The fan has two speeds with capacities of 1550 and 3150 c.f.m respectively.

The six-bladed senior is a 12-inch fan with speeds of 950 and 1200 r.p.m. and capacities of 1000 and 1350 c.f.m.

The junior fan comes either in a multi or six-bladed type and is 14- and 12-inch respectively. The multi-bladed type has two speeds—550 and 1150 with capacities of 1450 and 3100 c.f.m. The six blades has speeds of 950 and 1200 r.p.m. and capacities of 850 and 1000 c.f.m. This type is also supplied in a larger model with greater capacities.

The register type fan is an interesting unit. It is designed to make poorly circulating warm air leads work and is a fan enclosed within a circular housing with a heavy



wire mesh face. The fan may be hung on the front of the register, placed on the floor in front of either baseboard or wall register or it may be laid on its back on a floor register.

Complete information on this line of fans may be had from the manufacturer.

A Correction

One of our editorial policies is to be at all times unbiased in our descriptions of heating installations and equipment. It is our intention to give every piece of equipment fair judgment.

In the June 7th issue this policy was inadvertently violated in the statement, "misapplication of theory without sufficient practical experience is responsible for so many Holland jobs being unsatisfactory."

This statement has been called to our attention and we acknowledge that poor theory and lack of practical experience is just as common a fault with one type of equipment or one group of dealers as with any other.

Such a general criticism is unjust and we acknowledge the error.

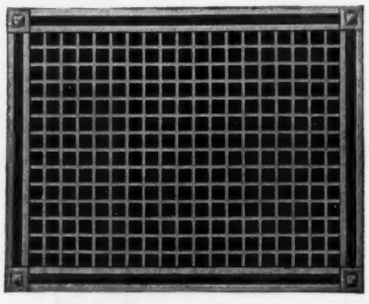
"Grilframe"—New Metal Construction Introduced by Harrington & King

The Harrington & King Perforating Company of Chicago are just now introducing a new grille construction to be merchandised unthe name of "Grilframe."

This improved method is said to offer a number of advantages.

First, it makes possible the cutting and assembling of grilles to any size from stock sheets and frame parts, avoiding any delay in getting grilles punched in pattern and to the size the job requires.

Second, the frame adds an attractive finish to the completed grille, giving a relief effect with the die cast ornamental corners and the



"Grilframe" completely assembled

"Grilframe" parts ready for assembly (Front view)

Grille secured to frame with lug (Back view)

frame or border strips in moulding effect.

The grille and frame can be finished to match in any color or tone desired.

E. I. Boardman Joins Richardson & Boynton Staff

E. I. Boardman has joined the executive sales staff of Richardson & Boynton Company, New York.

Mr. Boardman was for a number of years connected with several branch offices of the American Radiator Company and was recently associated with the executive offices of the National Radiator Corporation at New York and Johnstown, Pa.

A section of the library in the offices of **AMERICAN ARTISAN** *Chicago*

We hope you are going fishing—

or touring, or boating, or golfing, or whatever it is that your better half decides you are going to do this summer but we also hope that your route takes you to Chicago because we want you to visit us.

And of course that means that you are cordially invited to have your mail sent here, to use our information files, telephones and stenographic service.

And if you can't wait until you get home to read the accumulated copies of the ARTISAN, we'll gladly supply you with the issues you've missed so you can read them on your way home.

139 North Clark Street
Chicago
Opposite the City Hall

American Artisan
THE WARM AIR HEATING AND SHEET METAL JOURNAL

~ MARKET QUOTATIONS ~

AMERICAN ARTISAN is the only publication quoting Prices on Metals, Sheet Metal Equipment and Supplies, Warm Air Heating Supplies and Accessories, corrected bi-weekly. These quotations are not guaranteed but are obtained from reliable sources and reflect nation-wide market conditions at the time of going to press.

NOTE—These prices are Chicago Warehouse Prices to which must be added territory differentials

METALS

PIG IRON

Chicago Fdy., No. 2	$18.50
Southern Fdy. No. 2	18.01
Lake Superior Charcoal	23.04 to 27.04
Malleable	18.50

FIRST QUALITY BRIGHT CHARCOAL TIN PLATES

IC	20x28	112 sheets	$22.50
IX	20x28		25.50
IXX	20x28	56 sheets	14.50
IXXX	20x28		15.50
IXXXX	20x28		17.00

TERNE PLATES

	Per Box
IC 20x28, 40-lb. 112 sheets	$25.00
IX 20x28, 40-lb. 112 sheets	27.75
IC 20x28, 25-lb. 112 sheets	21.15
IX 20x28, 25-lb. 112 sheets	23.80
IC 20x28, 20-lb. 112 sheets	19.55
IV 20x28, 20-lb. 112 sheets	22.05

"ARMCO" INGOT IRON PLATES

No. 8 ga.—110 lbs.	$4.15
3/16 in.—100 lbs.	4.05
¼ in.—100 lbs.	3.85

COKE PLATES

Cokes, 80 lbs., base, 20x28	$12.00
Cokes, 90 lbs., base, 20x28	12.20
Cokes, 100 lbs., base, 20x28	13.75
Cokes, 107 lbs., base, IC, 20x28	12.75
Cokes, 135 lbs., base, IX, 20x28	14.75
Cokes, 155 lbs., base, 2X, 56 sheets	8.50
Cokes, 175 lbs., base, 3X, 56 sheets	9.35
Cokes, 195 lbs., base, 4X, 56 sheets	10.25

BLUE ANNEALED SHEETS

Base 10 ga. per 100 lbs.	$3.35
"Armco" 10 ga. per 100 lbs.	4.15

ONE PASS COLD ROLLED BLACK

No. 18-20 per 100 lbs.	$3.85
No. 22 per 100 lbs.	4.00
No. 24 per 100 lbs.	4.05
No. 26 per 100 lbs.	4.15
No. 27 per 100 lbs.	4.20
No. 28 per 100 lbs.	4.30

GALVANIZED

No. 16 per 100 lbs.	$4.10
No. 18 per 100 lbs.	4.20
No. 20 per 100 lbs.	4.40
No. 22 per 100 lbs.	4.45
(Standard differentials on extras to apply)	
No. 24 per 100 lbs.	$4.60
No. 26 per 100 lbs.	4.85
No. 27 per 100 lbs.	4.95
No. 28 per 100 lbs.	5.10
"Armco" 24 per 100 lbs.	6.15

BAR SOLDER

Warranted 50-50 per 100 lbs.	$22.50
45-55 per 100 lbs.	21.50
48-52 per 100 lbs.	20.50
Plumbers' per 100 lbs.	18.00

ZINC

In Slabs	$5.50

SHEET ZINC

Cask Lots (600 lbs.)	$12.00
Sheet Lots (100 lbs.)	13.00

BRASS

Sheets, Chicago base	18 ¾ c
Tubing, brazed, Chicago base	26 ¼ c
Tubing, seamless, Chicago base	23 ¾ c
Wire, Chicago base	19 ¼ c
Rods, Chicago base	17c

COPPER

Sheets, Chicago base	21 ¾ c
Tubing, seamless, Chicago base	24 c
Wire, plain rd., 8 B. & S. Ga. and heavier	14 c

LEAD

American Pig	$6.50
Bar	8.50

TIN

Bar Tin per 100 lbs.	$39.00
Pig Tin per 100 lbs.	38.00

SHEET METAL SUPPLIES, WARM AIR FURNACE FITTINGS AND ACCESSORIES

ASBESTOS

Paper up to 1/16	6c per lb.
Roll board	7 ½ c per lb.
Mill board 3/32 to ⅛	7 ½ c per lb.
Corrugated paper (250 sq. ft. per roll)	$6.00 per roll

ASBESTOS SEGMENTS

8 in. per 100 sets	$7.30
9 in. per 100 sets	8.30
10 in. per 100 sets	9.30
12 in. per 100 sets	10.50

CEMENT FURNACE

American Seal, 5-lb. cans, net	$0.40
American Seal, 10-lb. cans, net	0.80
American Seal, 25-lb. cans, net	2.00
Pecora per 100 lbs.	7.50

CLIPS

Damper

No-Rvet Steel, with tail pieces, per gross	$9.50
Rivet Steel, with tail pieces, per gross	7.50
Tail pieces, per gross	2.40

COPPER FOOTING

Copper Footing	34 %

CORNICE BRAKES

Chicago Steel Bending

Nos. 1 to 6B	Net

CUT-OFFS

Cal., plain, round or cor. rd.

26 gauge	30 %
28 gauge	35 %

DAMPERS

Yankee Hot Air

7 inch, doz.	$1.60
8 inch, doz.	2.20
9 inch, doz.	2.60
10 inch, doz.	2.80
12 inch, doz.	3.50
14 inch, doz.	5.00

EAVES TROUGH

Galv. Crimpedge, crated	75-10 %
Zinc, "Barnes"	60 %

ELBOWS

Conductor Pipe

Galv. plain or corrugated, round flat Crimp.

28 gauge	60 %
26 gauge	45 %
24 gauge	15 %

Galv. Terne Steel

Plain Rd. and Rd. Corr.

28 gauge	60 %
26 gauge	45 %
24 gauge	15 %

Square Corrugated

28 gauge	50 %
26 gauge	35 %

Portico Elbows

Standard Gauge Conductor Pipe, plain or corrugated.

Not nested	70 & 5 %
Nested solid	70 & 5 %

Sq. Corr., A. & B. & Octagon

28 gauge	50 %
26 gauge	35 %

Portico

1, 1¼, 1½ inch	45 %

Copper

16 oz. all designs	45 %

Zinc

All styles	60 %

ELBOWS—Stove Pipe

1-piece Corrugated, Uniform Blue "Milcor" No. 28 Gauge.

	Doz.
5 inch	$1.15
6 inch	1.26
7 inch	1.75

Special Corrugated

6 inch	$1.00
7 inch	1.60

Adjustable—Uniform Blue

"Milcor" No. 28 Gauge, Uniform Blue.

5 inch	$1.60
6 inch	1.75
7 inch	2.10

WOOD FACES—60 % off list.

FIRE POTS

Geo. W. Diener Mfg. Co.

	Each
No. 02 Gasoline Torch, 1 qt.	$5.13
No. 9250, Kerosene, or Gasoline Torch, 1 qt.	6.50
No. 10 Tinner's Furnace Square tank, 1 gal.	11.20
No. 15 Tinner's Furnace Round tank, 1 gal.	10.70
No. 21 Gas Soldering Furnace	8.00
No. 110 Automatic Gas Soldering Furnace	10.50

GLASS

Single and Double Strength, A, all brackets	85 %
Single and Double Strength, B, all brackets	87 %

HANGERS

Conductor Pipe

Milcor Perfection Wire	25 %
Milcor Triplex Wire	10 %

Eaves Trough

Milcor Steel (galv. after forming) from list	45 %
Milcor Selflock E. T. Wire, List	10 %

HOOKS

Conductor

"Direct Drive" Wrought Iron for wood or brick	15 %

MITRES

Galvanized Steel Mitres

28 gauge	70
26 gauge	60-20

PASTE

Asbestos Dry Paste

200-lb. barrel	$15.00
100-lb. barrel	7.75
50-lb. pail	4.50
25-lb. pail	2.50
10-lb. bag	1.20
5-lb. bag	0.60

PIPE

Galvanized

Crated and nested (all gauges)	75-7 ½ %
Crated and not nested (all gauges)	75-2 ½ %

Furnace Pipe

Double Wall Pipe and Fittings	60 %
Single Wall Pipe, Round Galvanized Pipe	60 %
Galvanized and Tin Fittings	60 %

Lead

Per 100 lbs.	$12.50

Stove Pipe "Milcor" "Titelock" Uniform Blue

Stove 28 gauge, 5 inch U. C. nested	$11.00
28 gauge, 6 inch U. C. nested	12.00
28 gauge, 7 inch U. C. nested	14.00
30 gauge, 5 inch U. C. nested	10.25
30 gauge, 6 inch U. C. nested	11.00
30 gauge, 7 inch U. C. nested	13.00

T-Joint Made Up

6 inch, 28 ga. per doz.	$3.40

REGISTERS AND FACES

Floor Registers

Except Cast Iron	40 & 10 %
Cast Iron	20 %

Baseboard

2-Piece	40 & 10 %
1-Piece	40-10 & 20 %

Adjustable Ventilators

Adjustable Cold Air Faces	40 & 10 %
Adjustable Ventilators	40 & 10 %

RIDGE ROLL

Galv. Plain Ridge Roll, b'dld	75-15-5 %
Galv., Plain Ridge Roll, crated	75-15 %

SCREWS

Sheet Metal

7, ½ x ½, per gross	$0.52
No. 10, ¾ x 3/16, per gross	0.65
No. 14, ⅞ x ¼, per gross	0.83

SHEARS, TINNERS' AND MACHINISTS'

Viking	$22.00

Lennox Threatless

No. 18	35 %
Shear blades	10 %

(f. o. b. Marshalltown, Iowa.)

SHOES

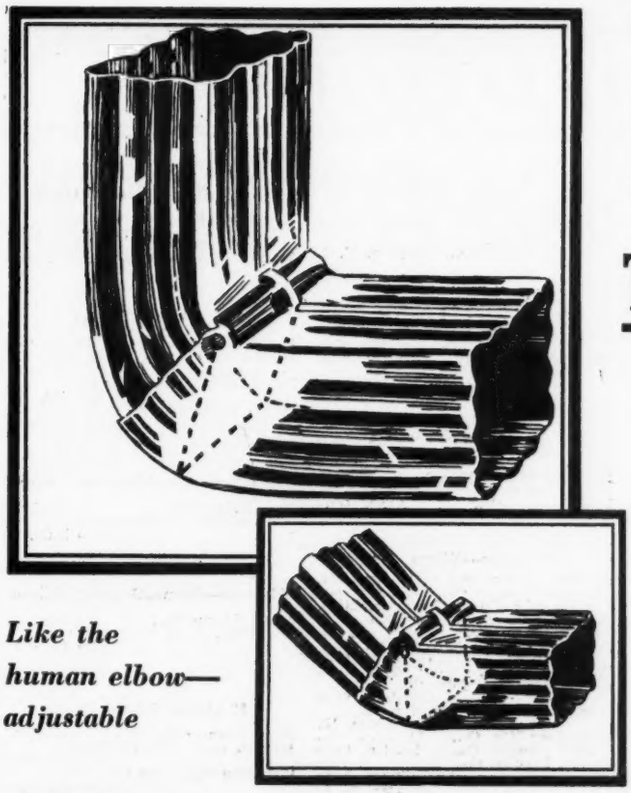
Galv. 28 Gauge, Plain or Corrugated, round flat crimp	60 %
26 gauge, round flat crimp	45 %
24 gauge, round flat crimp	15 %

SNIPS, TINNERS'

Milcor	Net

VENTILATORS

Standard	30 to 40 %
Milcor	Net



Like the human elbow—adjustable

NOTE: Extra double wall thickness at the most vital point

You have been waiting for this *adjustable* down-spout elbow—

The "Master" Adjustable Elbow

Is a Time and Labor Saver

This patented elbow can be adjusted to any degree of pitch between 15 and 90°. No tools are needed. The patented features of this elbow enable you to connect gutter and down spout in a few seconds.

The Most Revolutionary Time and Labor Saver of Recent Years

No Higher Cost for the "Master" Elbow

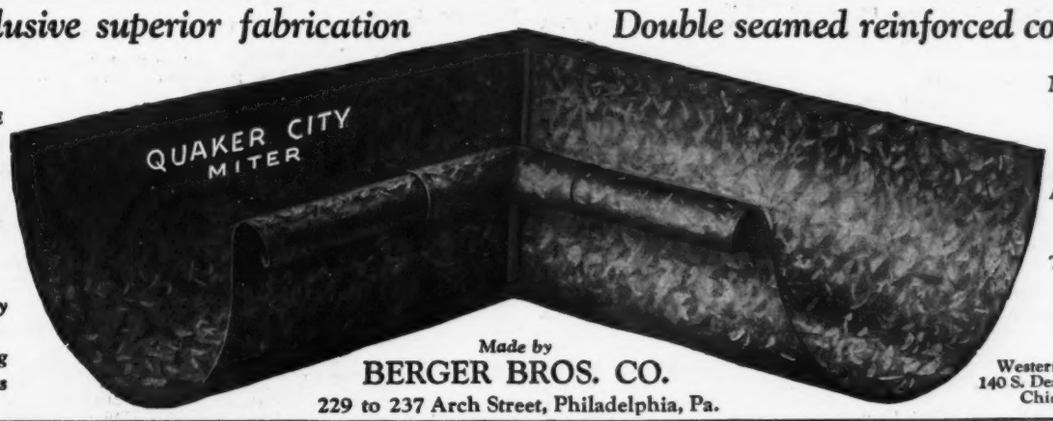
FURTHER INFORMATION ON REQUEST

APEX GUTTER HANGER CORPORATION

15 MOORE STREET NEW YORK CITY

Exclusive superior fabrication ***Double seamed reinforced corner***

TRADE BB MARK



Made in Galvanized Steel

ARMCO IRON

TONCAN METAL AND COPPER

Sold by all leading Jobbers

Made by
BERGER BROS. CO.
229 to 237 Arch Street, Philadelphia, Pa.

Western Office
140 S. Dearborn St.
Chicago

RYERSON

IMMEDIATE SHIPMENT FROM STOCK

More than twenty kinds of prime quality sheets are carried in stock. There is a special sheet for every purpose. Also Bars, Angles, Rivets, Bolts, Tools and Metal-Working Machinery.

Write for Journal and Stock List

JOSEPH T. RYERSON & SON INC.

Chicago Detroit · Milwaukee St. Louis · Jersey City Cincinnati · Buffalo Cleveland · Philadelphia Boston

SHEETS

Ready to Use

Needs only Heat

EXACT

No more soldering failures—Kester eliminates the guesswork of separate fluxes. Simple, sure, self-fluxing operation will speed your work and save you money on every sheet metal job. Use Kester Acid-Core Solder for shop-work. It is made in many gauges. Write for samples of the new Kester Body Solders.

FROM ALL JOBBERS

KESTER SOLDER COMPANY
4241 Wrightwood Ave. Chicago, Illinois
Incorporated 1899—Formerly Chicago Solder Co.

KESTER FLUX-CORE SOLDER

ACID-CORE · ROSIN-CORE · PASTE-CORE
METAL MENDER · RADIO SOLDER

BUYERS' DIRECTORY

Air Cleaners
Meyer & Bro. Co., F., Peoria, Ill.

Aluminum Sheets
J. M. & L. A. Osborn Co., Cleveland, Ohio

Blast Gates
Berger Bros. Co., Philadelphia, Pa.

Blowers—Furnace
American Machine Products Co., Marshalltown, Iowa
Brundage Co., Kalamazoo, Mich.
Lakeside Co., Hermansville, Mich.
Warm Air Furnace Fan Co., Cleveland, Ohio

Bolts—Stove
Lamson & Sessions Co., Cleveland, Ohio
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Brakes—Bending
Dreis & Krump Mfg. Co., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Brakes—Cornice
Dreis & Krump Mfg. Co., Chicago, Ill.

Brass and Copper
American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Copper & Brass Research Association, New York, N. Y.
Revere Copper & Brass, Rome, N. Y.

Bronze
Revere Copper & Brass, Rome, N. Y.

Cans—Garbage
Diener Mfg. Co., G. W., Chicago, Ill.
Osborn Co., The J. M. & L. A., Cleveland, Ohio

Castings—Malleable
Fanner Mfg. Co., Cleveland, Ohio

Ceilings—Metal
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Chaplets
Fanner Mfg. Co., Cleveland, Ohio

Cleaners—Vacuum
Brillion Furnace Co., Brillion, Wis.
National Super Service Co., Toledo, Ohio

Copper
American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Revere Copper & Brass, Rome, N. Y.
Rockford Sheet Steel Co., Rockford, Ill.

Cornices
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Cut-offs—Rain Water
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Dampers—Quadrants—Accessories
Hart & Cooley Co., Holland, Mich.
Howes Co., S. M., Boston, Mass.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Parker-Kalon Corp., New York, N. Y.

Dampproofings
Lastik Products Corp., Pittsburgh, Pa.

Damper Regulators
Sheer Co., H. M., Quincy, Ill.

Diffuser—Air Duct
Aeolus-Dickinson Co., Chicago, Ill.

Drills—Electric
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
J. M. & L. A. Osborn Co., Cleveland, Ohio

Drive Screws—Hardened Metallic
Parker-Kalon Corp., 200 Varick St., New York

Dust Eliminator
Dustless Ash Co., Muskegon, Mich.

Eaves Trough
Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Rockford Sheet Steel Co., Rockford, Ill.

Elbow and Shoes—Conductor
Apex Gutter Hanger Corp., New York, N. Y.
Barnes Metal Products Co., Chicago, Ill.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Rockford Sheet Steel Co., Rockford, Ill.

Fittings—Conductor
Barnes Metal Products Co., Chicago, Ill.
Braden Mfg. Co., Terre Haute, Ind.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Fluxes—Soldering
Kester Soldering Co., Chicago, Ill.

Furnace Cement
Connors Paint Mfg. Co., Wm., Troy, N. Y.
Lastik Products Corp., Pittsburgh, Pa.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Furnace Chain
Hart & Cooley Co., Holland, Mich.

Furnace Cleaners—Suction
Brillion Furnace Co., Brillion, Wis.
National Super Service Co., Toledo, Ohio

Furnace Fans
A-C Mfg. Co., Pontiac, Ill.
Brundage Co., The, Kalamazoo, Mich.
Lakeside Co., Hermansville, Mich.
Robinson Co., A. H., Massillon, Ohio
Warm Air Furnace Fan Co., Cleveland, Ohio

Furnace Paste
Western Mineral Products Co., Omaha, Neb.

Furnace Pokers
Fanner Mfg. Co. Cleveland, Ohio

Furnace Pulleys
Hart & Cooley Co., Holland, Mich.

Furnace Regulators
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Sheer Co., H. M., Quincy, Ill.
White Mfg. Co., Minneapolis, Minn.

Furnace Rings
Forest City-Walworth Run Foundries Co., Cleveland, Ohio
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Furnace Switch—Automatic
Payne Furnace & Supply Co., Beverly Hills, Cal.
Robinson Co., A. H., Massillon, Ohio

Furnaces—Gas
Calkins & Pearce, Columbus, Ohio
Payne Furnace & Supply Co., Beverly Hills, Cal.
Robinson Co., A. H., Massillon, Ohio
Rudy Furnace Co., Dowagiac, Mich.
Wise Furnace Co., Akron, Ohio

Furnaces—Warm Air
Agricola Furnace Co., Gadsden, Ala.
American Furnace Co., St. Louis, Mo.
The Beckwith Co., Dowagiac, Mich.
Brillion Furnace Co., Brillion, Wis.
Farris Furnace Co., Springfield, Ill.
Forest City-Walworth Run Fdy., Cleveland, Ohio
Fox Furnace Co., Elyria, Ohio
Henry Furnace & Fdy. Co., Cleveland, Ohio
Hess Warming & Ventilating Co., Chicago, Ill.
Langenberg Mfg. Co., St. Louis, Mo.
London Furnace Co., London, Ohio
Lennox Furnace Co., Marshalltown, Iowa
Syracuse, N. Y.
May Fiebeger Furnace Co., Newark, Ohio
Meyer Furnace Co., The., Peoria, Ill.
Midland Furnace Co., Columbus, Ohio
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Payne Furnace & Supply Co., Beverly Hills, Cal.
Premier Warm Air Heater Co., Dowagiac, Mich.
Peerless Foundry Co., Indianapolis, Ind.
Richardson & Boynton Co., New York, N. Y.
Robinson Co., A. H., Massillon, Ohio
Rudy Furnace Co., Dowagiac, Mich.
Standard Fdy. & Furnace Co., De Kalb, Ill.
Success Heater Mfg. Co., Des Moines, Iowa
Schwab & Sons Co., R. J., Milwaukee, Wis.
Waterman-Waterbury Co., Minneapolis, Minn.
Western Steel Products Co., Duluth, Minn.
Wise Furnace Co., Akron, Ohio

Gas Burning Attachments
Munkel-Rippel Heating Co., Columbus, Ohio

Grilles
Auer Register Co., Cleveland, Ohio
Harrington & King Perforating Co., Chicago, Ill.
Hart & Cooley Co., New Britain, Conn.
Independent Register & Mfg. Co., Cleveland, Ohio

Guards—Machine and Belt
Harrington & King Perforating Co., Chicago, Ill.

Handles—Boiler
Berger Bros. Co., Philadelphia, Pa.

Handles—Soldering Iron
Hyro Mfg. Co., New York, N. Y.

Handles—Furnace Door
Fanner Mfg. Co., Cleveland, Ohio

Hangers—Eaves Trough
Apex Gutter Hanger Corp., New York, N. Y.
Berger Bros. Co., Philadelphia, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Heat Regulation Systems
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Sheer Co., H. M., Quincy, Ill.
White Mfg. Co., Minneapolis, Minn.

Heaters—Cabinet
Fox Furnace Co., Elyria, Ohio
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Payne Furnace & Supply Co., Beverly Hills, Cal.
Waterman-Waterbury Co., Minneapolis, Minn.

Heaters—Combination Water
Alamo Heater Co., Chicago, Ill.
Standard Fdy. & Furnace Co., De Kalb, Ill.

Heaters—Domestic Hot Water
Alamo Heater Co., Chicago, Ill.
Standard Fdy. & Furnace Co., De Kalb, Ill.

Heaters—School Room
Meyer Furnace Co., The, Peoria, Ill.
Western Steel Products Co., Duluth, Minn.
Waterman-Waterbury Co., Minneapolis, Minn.

Humidifiers
Automatic Humidifier Co., Cedar Falls, Iowa
Diener Mfg. Co., G. W., Chicago, Ill.
Meyer & Bro. Co., F., Peoria, Ill.
Sheer Co., H. M., Quincy, Ill.

Lath—Expanding Metal
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Machines—Crimping
Bertsch & Co., Cambridge City, Ind.

Machinery—Culvert
Bertsch & Co., Cambridge City, Ind.
Interstate Machinery Co., Chicago, Ill.

Machines—Tinsmith's
Bertsch & Co., Cambridge City, Ind.
Dreis & Krump Mfg. Co., Chicago, Ill.
Hyro Mfg. Co., New York, N. Y.
Interstate Machinery Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Iowa
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
The Stanley Works, New Britain, Conn.
Whitney Mfg. Co., W. A., Rockford, Ill.

Metals—Perforated
Harrington & King Perforating Co., Chicago, Ill.

Miters—Eaves Trough
Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Braden Mfg. Co., Terre Haute, Ind.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Nails—Copper and Brass
Chase Brass & Copper Co., Waterbury, Conn.
Revere Copper & Brass, Rome, N. Y.

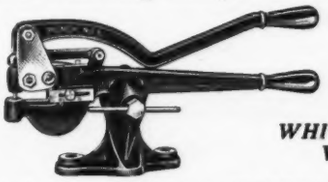
(Continued on page 54)

Get the work out faster and better with—

WHITNEY Lever PUNCHES

The Choice of OVER 40,000 Satisfied Users

Write for catalog and prices today



No. 8 CLOSE CORNER PUNCH

WHITNEY VISE

CAPACITY ¼ in. through ⅜-in. iron. Weight 7½ lbs. Length 18½ inches. Depth of throat 2 inches. Upper lever does not throw back to right angles. Simple, easy and quick punch changing. Side Gauge with marked fractional inches. Sold with or without Vise.

This Vise is handy, practical and securely holds any of the Whitney Lever Punches. Well made of high-grade Malleable Iron. It bolts to bench or can be bolted to plank and used portably. Weighs only 5 lbs.

It costs very little and is indispensable once you use it—get yours now

W. A. WHITNEY MFG. CO.

636 Race Street **Rockford, Ill.**

Ask Your Jobber for ***Punches and Tools***

TRADE MARK REGISTERED

Aeropull

STORM BAND VENTILATOR

THE design of the Aeropull Ventilator makes it free from choking down tendencies. It is designed especially for fan work.

The storm band on the Aeropull is 50% greater than standard and the free exhaust is 50% greater also.

It is a more durable, larger and more efficient ventilator at a lower price

WRITE FOR CATALOG AND PRICES TODAY

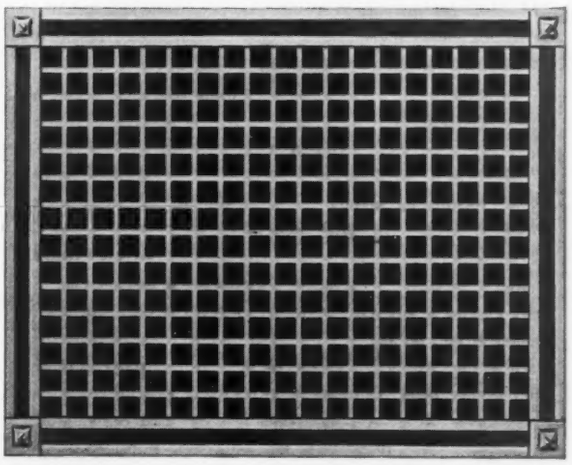
PAUL R. JORDAN & CO.

630 South Delaware St. **Indianapolis, Ind.**

Grilframe

(Trade Mark)

The NEW Grille Construction



"Grilframe"

creates new standards of beauty convenience and economy—

"Grilframe" is the trade-marked name of a new grille construction (patents applied for). It makes possible 48 hour service on assembled and finished grilles of any size and *in a wide choice of designs. The completed "Grilframe" is extremely rugged and beautiful yet surprisingly economical.*

Shipments are made from our factory or from distributors established in various cities throughout the country who assemble, finish when required, and ship immediately. Write us for the name of distributor nearest you.

Send for our 24-page "Grilframe" booklet which illustrates and describes this new and better method.

We will consider applications from distributors for unassigned territories. Only stock required consists of grille sheets 4′ x 10′, frame strips in 12′ lengths and the die cast corners. No special equipment required to assemble "Grilframe."

The Harrington & King Perforating Company

5649 Fillmore Street - - Chicago, Ill.

New York Office: 114 Liberty Street

"Grilframe" parts ready for assembly (Front view)

Corners inserted, grille clipped (Back view)

Grille secured to frame with lug (Back view)

BUYERS' DIRECTORY

(Continued from Page 52)

Nails—Hardened Masonry
Parker-Kalon Corp., New York, N. Y.

Oil Burners
Crystal Oil Burner Corp., New York, N. Y.
McIlvaine Burner Corp., Evanston, Ill.

Paint
Connors Paint Mfg. Co., Wm., Troy, N. Y.

Perforated Metals
Harrington & King Perforating Co., Chicago, Ill.

Pipe and Fittings—Furnace
Henry Furnace & Fdy. Co., Cleveland, Ohio
Lamneck & Co., W. E., Columbus, Ohio
Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Peerless Foundry Co., Indianapolis, Ind.

Pipe and Fittings—Stove
Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Pipe—Conductor
Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Punches
Bertsch & Co., Cambridge City, Ind.
Hyro Mfg. Co., New York
Interstate Machinery Co., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
W. A. Whitney Mfg. Co., Rockford, Ill.

Punches—Combination Bench and Hand
Hyro Mfg. Co., New York, N. Y.

Punches—Hand
Hyro Mfg. Co., New York, N. Y.
W. A. Whitney Mfg. Co., Rockford, Ill.

Putty—Stove
Connors Paint Mfg. Co., Wm., Troy, N. Y.

Radiator Cabinets
Hart & Cooley Co., Holland, Mich.

Ranges—Gas
The Beckwith Co., Dowagiac, Mich.
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Richardson & Boynton Co., New York, N. Y.

Registers—Warm Air
Auer Register Co., Cleveland, Ohio
Forest City-Walworth Run Foundries Co., Cleveland, Ohio
Hart & Cooley Co., Holland, Mich.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Independent Register & Mfg. Co., Cleveland, Ohio
Lamneck & Co., W. E., Columbus, Ohio
Meyer & Bro. Co., F., Peoria, Ill.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Rock Island Register Co., Rock Island, Ill.
Symonds Register Co., St. Louis, Mo.

Registers—Wood
American Wood Register Co., Plymouth, Ind.
Auer Register Co., Cleveland, Ohio
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Regulators—Heat
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
H. M. Sheer Co. Chicago, Ill.
White Mfg. Co., Minneapolis, Minn.

Ridging
American Rolling Mill Co., Middletown, Ohio
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Rivets—Stove
Lamson & Sessions Co., Cleveland, Ohio
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Rods—Stove
Lamson & Sessions Co., Cleveland, Ohio

Rolls—Forming
Bertsch & Co., Cambridge City, Ind.
Interstate Machinery Co., Chicago, Ill.

Roofing Cement
Connors Paint Mfg. Co., Wm., Troy, N. Y.
Lastik Products Corp., Pittsburgh, Pa.

Roof Paints
Lastik Products Corp., Pittsburgh, Pa.

Roof—Flashing
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Roofing—Iron and Steel
American Rolling Mill Co., Middletown, Ohio
Central Alloy Division, Republic Steel Corp., Youngstown, Ohio
Inland Steel Co., Chicago, Ill.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Ryerson & Sons, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Roofing—Tin
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Taylor Co., N. & G., Philadelphia, Pa.

Rubbish Burners
Hart & Cooley Co., New Britain, Conn.

Schools—Sheet Metal Pattern Drafting
St. Louis Technical Institute, St. Louis, Mo.

Schools—Warm Air Heating
St. Louis Technical Institute, St. Louis, Mo.

Screws—Hardened Metallic Drive
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Parker-Kalon Corp., 200 Varick St., New York

Screws—Hardened Self-Tapping, Sheet Metal
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Parker-Kalon Corp., 200 Varick St., New York

Screens—Perforated Metal
Harrington & King Perforating Co., Chicago, Ill.

Shears—Hand and Power
Interstate Machinery Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Ia.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
The Stanley Works, New Britain, Conn.
Viking Shear Co., Erie, Pa.

Sheet Metal Screws—Hardened, Self-Tapping
Parker-Kalon Corp., 200 Varick St., New York

Sheets—Alloy
Central Alloy Division, Republic Steel Corp., Youngstown, Ohio
International Nickel Co., New York, N. Y.

Sheets—Black and Galvanized
American Rolling Mill Co., Middletown, Ohio
Central Alloy Division, Republic Steel Corp., Youngstown, Ohio
Inland Steel Co., Chicago, Ill.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
National Association of Flat Rolled Steel Manufacturers, Cleveland, Ohio
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Rockford Sheet Steel Co., Rockford, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
Taylor Co., N. & G., Philadelphia, Pa.

Sheets—Iron
American Rolling Mill Co., Middletown, Ohio
Central Alloy Division, Republic Steel Corp., Youngstown, Ohio
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Sheets—Tin
Taylor Co., N. & G., Philadelphia, Pa.

Shingles and Tiles—Metal
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Sifters—Ash
Diener Mfg. Co., G. W., Chicago, Ill.

Sky Lights
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Snips
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Solder—Acid Core
Kester Solder Co., Chicago, Ill.

Solder—Self-Fluxing
Kester Solder Co., Chicago, Ill.

Solder—Rosin Core
Kester Solder Co., Chicago, Ill.

Solder
Kester Solder Co., Chicago, Ill.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Soldering Coppers
Revere Copper & Brass, Rome, N. Y.

Soldering Furnaces
Diener Mfg. Co., G. W., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Specialties—Hardware
Diener Mfg. Co., G. W., Chicago, Ill.

Stars—Hard Iron Cleaning
Fanner Mfg. Co., Cleveland, Ohio

Tinplate
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Taylor Co., N. & G., Philadelphia, Pa.

Tools—Tinsmith's
Bertsch & Co., Cambridge City, Ind.
Dries & Krump Mfg. Co., Chicago, Ill.
Hyro Mfg. Co., New York, N. Y.
Interstate Machinery Co., Chicago, Ill.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Rockford Sheet Steel Co., Rockford, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.
The Stanley Works, New Britain, Conn.
Viking Shear Co., Erie, Pa.
Whitney Mfg. Co., W. A., Rockford, Ill.

Torches
Diener Mfg. Co., G. W., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chgo., N. Y., St. L., Det., Cleve.

Trade Extension
Copper & Brass Research Association
National Association of Flat Rolled Steel Manufacturers, Cleveland, Ohio
Sheet Steel Trade Extension Committee, Cleveland, Ohio

Trimmings—Stove and Furnace
Fanner Mfg. Co., Cleveland, Ohio

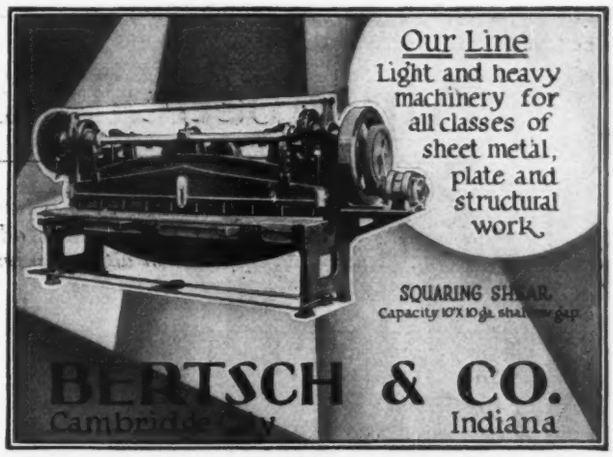
Vacuum Cleaner—Furnace
Brillion Furnace Co., Brillion, Wis.
National Super Service Co., Toledo, Ohio

Ventilators
Aeolus Dickinson Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Paul R. Jordan & Co., Indianapolis, Ind.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

Ventilators—Ceiling
Hart & Cooley Co., New Britain, Conn.
Henry Furnace & Fdy. Co., Cleveland, Ohio

Wood Faces—Warm Air
Auer Register Co., Cleveland, Ohio
American Wood Register Co., Plymouth, Ind.
Milcor Steel Co., Mil., Canton, Chgo., La Crosse, K. C.

LAMSON
& SESSIONS CO.
CLEVELAND, OHIO
Plants at Cleveland and Kent, Ohio; Chicago and Birmingham


Our Line
Light and heavy machinery for all classes of sheet metal, plate and structural work.
SQUARING SHEAR.
BERTSCH & CO.
Indiana

Sheet Metal Pattern Problems solved by experts---

In this issue and every issue of AMERICAN ARTISAN you will find one or two sheet metal patterns with full details as to how to develop them. Send in ***your*** problems for free solution. Save the pattern pages of each issue so your men can refer to them.

Progressive Sheet Metal and Warm Air Heating Contractors use Window Displays---

Let the other fellow see what a fine window display and store front you have. Send us a picture of your window display and tell us how it pulls extra business your way.

What form of advertising brings best results for your business---

Some dealers find newspaper advertising best and others use direct by mail with consistent good results. Some men find that large billboards or electric signs do the advertising job the best.

Send clippings of your newspaper advertising and samples of your direct by mail advertising to AMERICAN ARTISAN and tell us what results this advertising brought you.

If you use a large sign or billboards send us a photograph so we can show how you advertise your business.

CHICAGO STEEL SLITTING SHEAR
LIGHT—POWERFUL
DURABLE

Capacity 10 gauge sheets
Any Length or Width
Flat Bars 3/16x2"
Weight 22 pounds

Price $15.00 Net
F. O. B. Chicago

Made of pressed steel and equipped with hold-down. Blades of highest grade crucible steel. Most indispensable high grade shears made. Equal to other shears selling at over twice the price. ***ORDER YOURS TODAY.***

DREIS & KRUMP MFG. CO., 7404 Loomis St., Chicago

The "Torrid" Furnace is designed to give a tremendous amount of heat, much more than that furnished by the ordinary tinner's furnace.

A fuel saver and generating machine of the finest quality made at the price.

GEO. W. DIENER MFG. CO.
404 North Monticello Ave. Chicago

DETROIT-CLEVELAND-BUFFALO
THE J.M.&L.A.
OSBORN Co
EVERYTHING
USED IN SHEET METAL WORK
ASK FOR CATALOGUE OR PRICES

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Firms represented in this issue are identified by the folio of the page on which their advertising appears. Advertising which appears in alternate issues is marked with an asterisk.

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Agricola Furnace Co.* ....
Alamo Heater Co.* ....
American Brass Co. 13
American Fdy. & Furn. Co.* ....
American Furnace Co. 6
American Machine Products Co. 11
American Rolling Mill Co.* ....
American Wood Register Co. 10
Apex Gutter Hanger Corp. 51
Auer Register Co.* ....
Automatic Humidifier Co.* ....

Barnes Metal Prod. Co.* ....
Beckwith Co.* ....
Berger Bros. Co. 51
Bertsch & Co. 55
Braden Mfg. Co.* ....
Brillion Furnace Co. 7
Brundage Co.* ....

Calkins & Pearce* ....
Central Alloy Division Republic Steel Corp.* ....
Chase Brass & Copper Co.* ....
Connors Paint Co., Wm. 10
Copper and Brass Research Assn.* ....
Crystal Oil Burner Co.* ....

Deniston Co.* ....
Diener Mfg. Co., Geo. W. 55
Dreis & Krump Mfg. Co. 55
Dustless Ash Co. 10

Emrich Co., C.* ....

Fanner Mfg. Co. 10
Farris Furnace Co.* ....
Forest City-Walworth Run Foundries Co.* ....
Fort Shelby Hotel* ....
Fox Furnace Co.* ....

Harrington & King Perf. Co. 53
Hart & Cooley Co. 8
Henry Furn. & Fdy. Co. 4
Hess Warming & Ventilating Co.* ....
Howes Co., S. M.* ....
Hyro Mfg. Co. 47

Independent Reg. & Mfg. Co.* ....
Inland Steel Co.* ....
International Nickel Co. 59
Interstate Machinery Co. 58

Jordan & Co., Paul R. 53

Kester Solder Co. 51

Lakeside Co. 10
Lamneck & Co., W. E.* ....
Lamson & Sessions Co., The 55
Langenberg Mfg. Co.* ....
Lastik Products Co. 7
Lennox Furnace Co. 3
London Furnace Co.* ....

Marshall Furnace Co.* ....
Marshalltown Mfg. Co.* ....
May-Fiebeger Co. 6
McIlvaine Burner Corp. 10
Meyer & Bro. Co., F. 9
Meyer Furnace Co.* ....
Midland Furnace Co.* ....
Miller & Doing, Inc.* ....
Milcor Steel Co. Back Cover
Minneapolis-Honeywell Reg. Co.* ....
Munkel-Rippel Heating Co. 8
Mt. Vernon Furnace & Mfg. Co.* ....

National Assn. of Flat Rolled Steel Mnfrs.* ....
National Super Service Co. 8

Osborn Co., The J. M. & L. A. 55

Parker-Kalon Corp.* ....
Payne Furnace & Supply Co.* ....
Peck, H. E. 58
Peerless Foundry Co.* ....
Premier Warm Air Heater Co.* ....

Republic Steel Corp.* ....
Revere Copper & Brass, Inc.* ....
Richardson & Boynton Co.* ....
Robinson Co., A. H.* ....
Rock Island Register Co.* ....
Rockford Sheet Steel Co.* ....
Rudy Furnace Co.* ....
Ryerson & Son, Inc., Jos. T. 51

Sall Mountain Co.* ....
Schwab & Sons Co., R. J. 8
Sheer Co., H. M. 10
Standard Fdy. & Furn. Co.* ....
St. Louis Tech. Inst. 58
Success Heater Mfg. Co.* 2
Symonds Register Co.* ....

Taylor Co., N. & G.* ....

Viking Shear Co. 58

Warm Air Furnace Fan Co.* ....
Waterman-Waterbury Co. 5
Watt Mfg. Co.* ....
Western Mineral Products Co. 10
Western Steel Products Co. 14
White Mfg. Co.* ....
Whitney Mfg. Co., W. A. 53
Wise Furnace Co. 7

THE BUYERS' DIRECTORY APPEARS ON PAGES 52 AND 54

WANTS AND SALES

Yearly subscribers to the AMERICAN ARTISAN may insert advertisements of not more than fifty words in our Want and Sales Columns WITHOUT CHARGE for three insertions.

Such advertisements, however, must be limited to help or situation wanted, tools or equipment for sale, to exchange or to buy, business for sale or location desired, and must reach our office ten days prior to date of publication. This privilege is not extended to manufacturers or jobbers—or those making a business of buying and selling used machines—employment agencies and brokers.

When sending advertisement state whether your name or blind number is to be used.

BUSINESS CHANCES

Lightning Rods—Dealers who are selling Lightning Protection will make money by writing to us for our latest Factory to Dealer Prices. We employ no salesmen and save you all overhead charges. Our Pure Copper Cable and Fixtures are endorsed by the National Board of Fire Underwriters and hundreds of dealers. Write today for samples and prices. L. K. Diddie Company, Marshfield, Wis.

For Sale—Business and home, Illinois city of 100,000. Good chance for hustler. Corner lot 50x150, alley in rear. 5 room house. Business bldg. 22x52. Two stores, upper has shop, full set tinners tools and tin stock. Lower floor hardware store and stock and garage. Selling on account of age. $7000.00—excellent terms. Address S522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

For Rent—Furnace and sheet metal shop on northwest side of Chicago. One-story brick, 28x100; furnace heat. In business at the same address for ten years and a money maker. Forced to retire on account of old age. Can be leased with or without machinery, from August 1, 1930. Address M-523, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

For Sale—Plumbing and tin shop in central Alberta. Building on main street 25x30 ft., two story, with 6 living rooms above. Sewer just installed in town. Will take $2000.00 cash for building and tools. This is a snap for a man looking for a good opening. Address C. E. Hannay, P. O. Box 461, Stettler, Alberta, Canada. R522

Will sell very reasonably, tin and plumbing shop and warm air heating in one of the best towns in southwestern Minnesota. Doing a nice business but ill health forces me to sell. Address M522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

For Sale—Well equipped plumbing, heating and sheet metal shop. Only shop in town of 1600 population. Centrally located. Six good size living rooms in connection. Good chance for a hustler. Address P522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

For Sale—Old established furnace and sheet metal business in city of 10,000 population in the Northwest. Sold 320 furnaces in the past six years. Will take $5,000 cash to handle, or will accept good security for part of this. No trades. Address H-523, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

BUSINESS CHANCES

Wanted to Buy—Half or whole interest in sheet metal shop preferably located in Kansas, Missouri, Iowa or Oklahoma, or will go in as working partner in same. Can furnish A-1 references. Address P-523, AMERICAN ARTISAN, 139 N. Clark Street, Chicago, Ill.

For Sale—Tin shop, roofing and furnace business. Good trade, located on west side of Chicago. Fully equipped. Offer very reasonable. Selling on account of age. Address O522, AMERICAN ARTISAN, 139 N. Clark St., Chicago. Ill.

SITUATION WANTED

Situation Wanted—Sheet metal shop superintendent, thoroughly experienced in assuming full responsibility on all types of inside shop fabricating as well as carrying to completion outside construction jobs. Can handle any number of men satisfactorily. Many years of experience working for the largest shops and contractors in the country. Experienced in ventilation, humidity control, blower systems, etc. Will go anywhere. Address K-523, care AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Sheet Metal Mechanic, 21 years' experience in ventilating, skylight, cornice, furnace, restaurant and general sheet metal work desires position. Capable of taking any sized job. Experienced foreman and estimator. Best of references from former employers. Married, sober, reliable and anxious to connect with firm where there is a future. Employed, but wish to make a change. Address R-523, AMERICAN ARTISAN, 139 N. Clark Street, Chicago, Ill.

Some Furnace Manufacturer of prominence is looking for a young man of 26 interested in the betterment of the industry. I am a high school graduate with 8 years of experience in the Sheet Metal and Furnace work, something with a future. Not afraid of work. Best of references and will go anywhere. Address L522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation wanted by combination man, plumber and sheet metal worker experienced in plumbing, installing and jobbing, also furnaces and oil burners. Wish to connect with hardware store with shop in small town. Young, married, reliable and employed but want to make a change. Year around job. Address H522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Position wanted by experienced furnace and specialty salesman who personally knows and has sold most of the largest furnace dealers and jobbers in Iowa. Young married man 30 years of age and own my own home. Centrally located in Iowa. Can furnish best of references. Address J522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Combination plumber, fitter and tinner would like to get in touch with hardware company that can use a steady, reliable man of this kind. Can lay out and estimate all branches of this line with an interest in view. Address B-523, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation wanted by all around tinner, furnace heating a specialty. Experienced at plumbing and hardware store work. Would accept position anywhere west of Chicago. Please state kind of work you have and salary paid for permanent situation. Address W522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation Wanted—By practical tinner on furnace and gutter work. Active, steady and reliable. Would like steady work in small town or city in Illinois. Can come at once. Address J-523, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

SITUATION WANTED

Position wanted by experienced sheet metal worker on in and outside work, furnace work and general jobbing. Please state wages and working conditions. Address G522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Situation wanted by all around man with 28 years' of experience in tinning, plumbing, steel ceilings and all kinds of heating, etc. Wish position in Wisconsin. Address K522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

HELP WANTED

Wanted at Once—Ten experienced plumbing and tinning men to work as district managers, that are willing to invest from $500 to $1,000 in our company. We are opening shops in southern Illinois, Kentucky and southeastern Missouri. A real business opportunity. Address Independent Supply Co., Inc., West Frankfort, Ill. Y-522

Wanted—Sheet metal worker under 50 years of age. Must be good on furnace and gutter work and also have some knowledge of plumbing. This is a small town of 800 and 60 miles from Chicago. State age, experience and wages wanted in first letter. Address X-522, AMERICAN ARTISAN, 139 N. Clark St., Chicago.

Wanted—Sheet metal worker who is good on kitchen equipment work. Must be able to turn out first-class work in Monel and other noncorrosive metals and must be thoroughly familiar with welding of same. Address A-523, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Wanted—Tinner and furnace man. Prefer young married man nover over 35 years of age, with seven or eight years of experience. Steady job for right man and we will pay all he is worth. Address L-523, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Wanted—Salesmen who call on furnace installers and jobbers east of the Missouri river, to carry line of mineral paste that has proven a sales builder and repeats orders. Satisfactory commission on all orders. Write Western Mineral Products Co., Omaha, Neb. Z-522

Wanted—First class sheet metal worker for copper marquis work, also one ventilating man. One dollar per hour. Give full particulars as to experience. Address T522, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

TOOLS AND MACHINES

For Sale or Trade—One Chicago Elbow Machine complete with motor. Practically new. Capacity 5" to 36". 24 gauge or lighter. Makes an elbow in two minutes. Write for complete information to The Munkel-Rippel Heating Co., 569 N. 4th St., Columbus, Ohio. F522

I have several bench machines that I do not need. If interested, write for list. Address S. E. Ethridge, 1103 Denison St., Little Rock, Ark. C-523

For Sale—One No. 18 hand power rotary shear, almost new. Price, $20. Address Chas. Barnum, Mankato, Minn. O-523

MISCELLANEOUS

For Sale—Rock Island wall registers and boxes, as good as new, at a great sacrifice. Going out of the furnace business. Send for list and price. Address D-523, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

BOOKS

The Standard Code Computing Rule, which is adapted from Article III of the 5th Edition of the Standard Code, is being used by warm air heating men all over the country. Here is what the Computing Rule will determine: (1) The warm air pipe and register areas for first, second and third floor rooms. (2) The areas necessary for 70 degrees inside temperature when the outside temperatures are zero, 10, 20 and 30 degrees above or below zero. (3) The areas from the contents, glass, wall, roof and ceiling. The factors as covered in Table "A" are represented in accurate form. (4) The areas for rooms having one, one and one-half and two air changes per hour. (5) The unusual exposure requirements as the 10 per cent for each and west and 15 per cent for northeast, north and northwest rooms. Rule is circular, measuring 5½ inches in diameter and ⅛ inch thick, being made of specially prepared celluloid. Washable and unbreakable.

Price, $3.00, postpaid, from Book Department, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

BOOKS

The Revised Edition of the New Metal Worker Pattern Book by Kittridge and Associates is one book that should be in every shop. As a reference book alone it is indispensible. Over 500 9x11-inch pages with 895 illustrations. It covers the principles underlying practically every problem that is likely to come up in daily practice. Beginning with the selection and use of drawing tools, the author explains linear and geometrical drawing so clearly that one who has had nop revious knowledge of arithmetic or drawing may understand these essentials and apply them. The most approved methods of pattern cutting are also given in the course of the work... Price, $6.00, postpaid. Order from the Book Dept., AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

BOOKS

Exhaust and Blow Piping, by Hayes—Exhaust and Blow Piping has had an unusually big demand. A fresh supply is now off the press and is in our hands for immediate delivery. It has an invaluable treatise on the planning, cost, estimation and installation of fan piping in all its branches, giving all necessary guidance in fan work blower and separator construction. 159 pages, 5x8. 51 figures. Cloth. $2.00. Order from Book Department, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Illinois.

Manual of Automotive Radiator Construction and Repair, by F. L. Curfman and T. H. Leet—Anyone interested in Radiator Repairing will find the 185 pages of practical instructions and 120 illustrations showing actual construction and repairing a big help. In a condensed manner some four to five thousand answers to questions are given. It is thoroughly practical, as both authors are men of wide experience in this work. Printed in large, easy to read type. Measures 5¼x9 inches. Price $2.50. Order from Book Department, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

SPECIAL NOTICE!

To Manufacturers in This Industry

The problem of preparing correct, attractive and forceful trade paper and direct mail copy can be solved economically. Whether you are interested in one advertisement or direct mail piece or an entire campaign we advise you to consult us. We have a wide experience in the warm air heating industry. MAT FRIEDMAN & ASSOCIATES, 155 N. Clark St., Chicago.

G523

SPECIAL NOTICES

The Rate for Special Notices —displayed want ads—

$3.00 per inch per insertion

When sending copy, state whether your name or blind number is to be used—also how many insertions are desired.

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Advancement comes with a Comprehensive Training like we give in Sheet Metal Design and Pattern Drafting. It brings you more steady work—more yearly income—more satisfaction for yourself and family.

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Manufacturers' agents to handle furnace cement, roofing paint and cement, calking compound. Exclusive territory, commission basis. Address E-523, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Ill.

Established manufacturer of steel furnaces wants a capable salesman for Michigan and northern Indiana. Only those of proven reputation and ability to sell quality furnaces will be considered. Address F-523, AMERICAN ARTISAN, 139 N. Clark St., Chicago, Illinois.

Bargains Picked at Random From the Middle West's Largest Stock

SPECIAL

25—BRAND NEW ¼ HP. AC. MOTORS, in original boxes. Each $8.75

1—No. 18 P Marshalltown Shear..... $27.50
1—4 x 4 Marvel Hack Saw..... 20.00
1—Waugh Circle Shear..... 25.00
1—48-in. Toledo Power Circle Shear, 16 Ga. Capacity..... 125.00

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STOP *Trying to seal furnaces with* **CLAY**
USE **METALUTE** (Plastic Iron)
Order 12 lb. can at $2.40 or demand it with the furnace
Technical Products Co.
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VIKING SHEAR
Compound LEVER Handle—Removable Blades
A child can work them
Send for catalog today
VIKING SHEAR CO., Erie, Pa.

Silvery Monel Metal is used by Restaurants, Lunch Rooms and Sandwich Shops

FOR

Bars	Shelving
Canopies	Sinks
Counters	Drainboards
Cutlery boxes	Table Tops
Cabinets	Urn Stands
Railings	Warmers

Curtains and Hoods

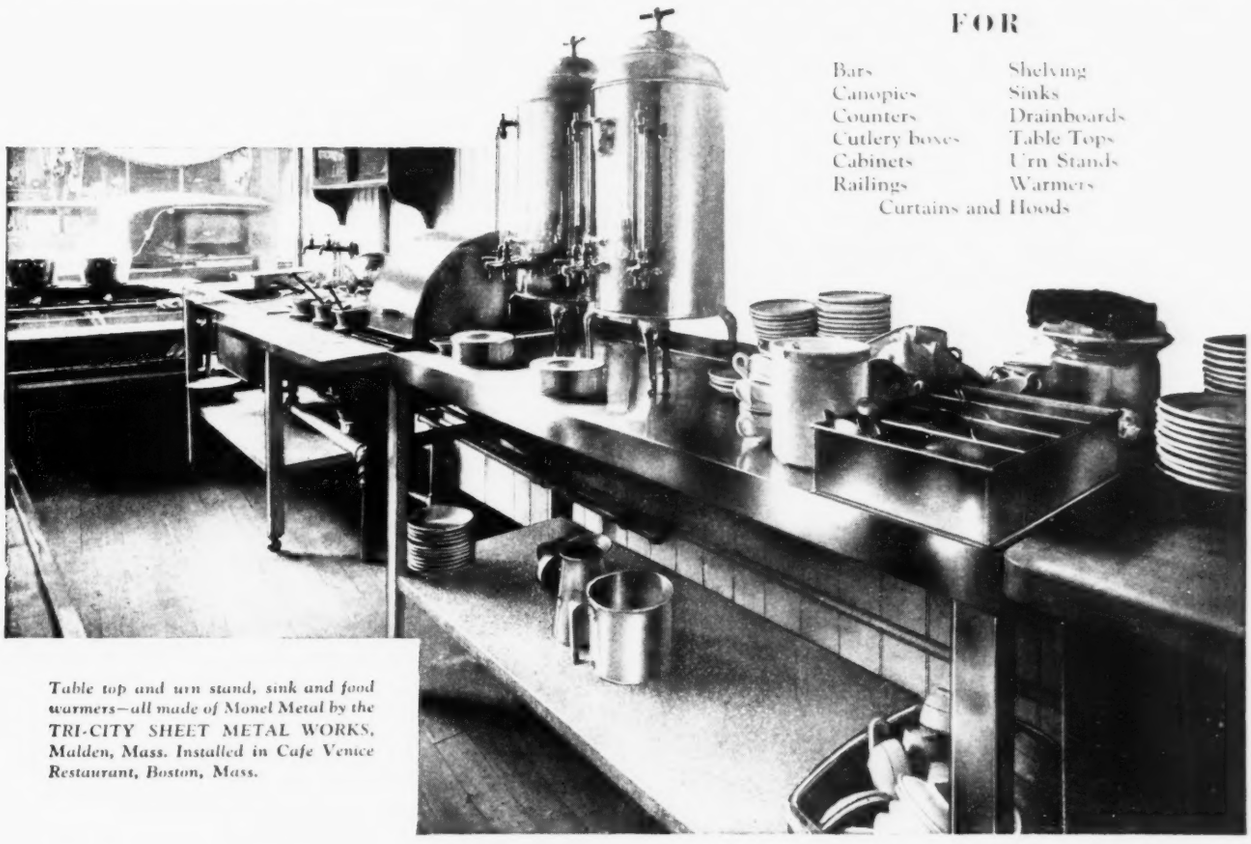

Table top and urn stand, sink and food warmers—all made of Monel Metal by the TRI-CITY SHEET METAL WORKS, *Malden, Mass. Installed in Cafe Venice Restaurant, Boston, Mass.*

You can make worth-while PROFITS *fabricating this Modern Equipment!*

The largest restaurant to the smallest cafeteria and lunchroom is a live prospect for custom-made Monel Metal equipment.

Nine out of ten of the country's leading hotels have found Monel Metal the most satisfactory material for food service applications. Smaller restaurants are benefiting by this experience of larger users. They also appreciate the exclusive advantages of this silvery Nickel alloy—its rust-immunity and resistance to corrosion—its easy cleanability and permanently attractive and sanitary appearance.

Much of this profitable business is ripe for the sheet metal specialist who is alert to the opportunity. Right now, the road to this ready market is being paved for you by extensive advertising in national and trade publications. Users are being urged to consult their local sheet metal workers when they need Monel Metal equipment.

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The fascinating story of Monel Metal—its properties and uses—is told in a 2-reel motion picture film. Write for details of free distribution.

Monel Metal is a registered trade-mark applied to a technically controlled nickel-copper alloy of high nickel content. Monel Metal is mined, smelted, refined, rolled and marketed solely by The International Nickel Company, Inc.

MONEL METAL

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK, N. Y.

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Announcement

EFFECTIVE
JULY FIRST NINETEEN HUNDRED AND THIRTY

Milwaukee Corrugating Co. and The Eller Mfg. Co. will be known as the

MILCOR STEEL COMPANY

Both companies have been well and favorably known to the trade for nearly half a century. Ownership, management and personnel will remain the same.

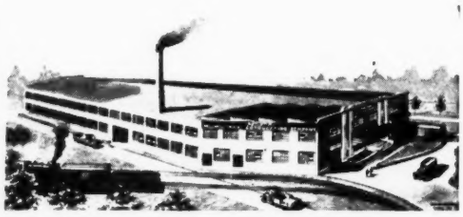
MILCOR STEEL COMPANY
(formerly Milwaukee Corrugating Co., Milwaukee, Wis. and The Eller Mfg. Co., Canton, Ohio)

Main Offices: 36th Ave. and Burnham St., Milwaukee

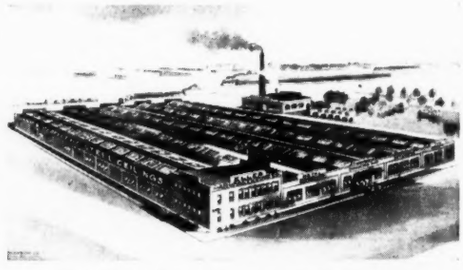
Plants at Milwaukee, Wis., Canton, Ohio, La Crosse, Wis., Chicago, Ill. and Kansas City, Mo.

Sales Offices: New York, 418 Pershing Sq. Building; Boston, Mass., 726 Little Building; Atlanta, Ga., 207 Bona Allen Building; Minneapolis, Minn., 642 Bldrs. Exchange Building; Little Rock, Ark., 104 W. Markham Street

CHICAGO PLANT, CHICAGO, ILL.



SOUTHWEST PLANT, KANSAS CITY, MO.



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